

The Journal of the **INSTITUTE OF METALS**

and **METALLURGICAL ABSTRACTS**



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JANUARY ~~1951~~ **1949**

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Assistant Secretary :

Major R. E. MOORE

Administrative and Editorial Offices :

Telephone :

4 GROSVENOR GARDENS, LONDON, S.W.1 SLOANE 6233

LETTER TO THE EDITOR

METALLURGICAL EDUCATION

SIR,

In the March 1949 issue of the *Journal of the Institute of Metals*, there appeared a review by Dr. Hume-Rothery of the book by A. H. Cottrell on "Theoretical Structural Metallurgy". The reviewer grasped this opportunity to comment on metallurgical education, as indeed he did also in writing his own book "Electrons, Atoms, Metals, and Alloys". Inasmuch as I have regarded the question of metallurgical education from a quite different point of view, I feel constrained to write this comment. The metals industries lie at the base of industrial civilization; the question is thus of such great importance to highly industrialized nations that it deserves the most careful consideration.

It is quite true that metallurgical education until the last decade or two had not risen far above descriptive technology—training consisted chiefly in the learning of the details of plant practices, with but little effort to seek the basic principles governing the practical techniques. The task of the educator in the present generation has been chiefly to identify the important engineering principles in metallurgy and to introduce them into metallurgical education, and, moreover, greatly to fortify the scientific basis for engineering. But in reading Dr. Hume-Rothery's comments, one feels that he would now sponsor a very much more radical point of view—a really extreme point of view, in my opinion—to the end that a metallurgist would be one who knows little or nothing about metals as a metallurgist knows them, and who knows metals from the physicist's point of view as well as the physicist himself.

The metallurgist has long been aware of the profit that can accrue to his subject from the labours of the physicist (or from that of the physical chemist, for that matter). Le Chatelier, Matthiessen, Roozeboom, and many, many others, contributed basic material and even inspiration to the metallurgical field, and their work was quickly absorbed by metallurgists, as early textbooks show. The relationships between metallurgy and correlated fields has been close in other ways: physicists and physical chemists have become metallurgists, and metallurgists have occasionally become physicists, as Langmuir did. This interplay between the more basic and the more applied is so familiar in so

many fields that it need not be stressed; its lessons have been long known, as, for example, in the case of pure mathematics and theoretical physics. There is no reason why the pure mathematician should have a somewhat snobbish regard for the physicist! As Conant recently implied, such looking-down-the-nose is a little unperceptive.

In considering education in metallurgy, it would be well to make a few elementary distinctions and definitions. We should be careful to distinguish, on the one hand, between those students who attend the university (or the institute of technology) for a period of four years, and, on the other hand, those who continue to graduate work. It is rarely possible to give the former much training in research in any field, whereas research (and all that it implies) is the whole purpose of the latter. And we need—badly, I think—to distinguish clearly between training for science on one hand and for engineering on the other. If one is to devise curricula for students, such distinctions must be made, else there can be no direction whatsoever to the educational effort.

The problem is this: should a man who ultimately is to work in industry be trained in pure science exclusively, or should he be trained in engineering? Experience seems to show that industry can find use for a few of the former, primarily in research, but can use many of the latter, in the full gamut of work in industry. The case of chemistry and chemical engineering is quite pertinent; the success of education in chemical engineering, a really great success, must demand the attention of those responsible for education in metallurgy. The industrial metallurgist in general is responsible for the manufacture of industrially useful articles. Good engineering education, in preparation for such a career, surely comprises good training in the basic sciences, but it encompasses much more than this, for there are principles of engineering to be recognized and learned. A glance at the standard textbooks in chemical engineering, which include basic science, techniques, design, economics, and human relationships, will show what engineering educators mean by engineering. And in the case of metallurgy itself, there is much metallurgical science to be learned, not learned in "basic science"; for example, the micro- and macro-structure of metals, heat-treatment, precipitation from solid solutions, reaction to applied stress, and the interplay of the thousand and one metallurgical variables, are now treated in a respectable scientific fashion.

Now these desiderata may be met by educational schemes, and they have been met in chemical engineering, and indeed in all other branches of engineering, including metallurgical. A study of the pedagogical research which has accompanied this development in recent years would be revealing to those who have not been intimately concerned with it. Purely descriptive education has long since been outmoded; the professor does not "teach" all the details of all industrial processes in his field—this would, of course, be useless, for these techniques are soon altered; he teaches principles, using actual industrial techniques as illustrations only. This is the type of education needed in metallurgy, and which is indeed practised in more than one place, including the excellent department at the University of Birmingham. This is "pure" metallurgy; surely one could hardly expect a "pure" metallurgist to be at the same time a "pure" physicist.

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One has the feeling that the discussion between the "older metallurgist" and the "young scientist" is prejudiced at the outset: should not the discussion be between a young metallurgist and a young scientist? The modern young metallurgist these days knows an astonishing amount of the information that came as a surprise to the older metallurgist; one might wonder what would be the result of a discussion between an older physicist and a young metallurgist!

Engineering education must be and is on a high professional level. A rigorous training in basic science and mathematics is an essential. The analysis of an engineering problem is not a simple thing; it requires firm scholarship and an active mind. The casting of metals (to which Dr. Hume-Rothery occasionally refers), as regarded by a modern engineer, is a highly complex phenomenon, demanding superior ability—the work in this field which is now current in the laboratory of the British Non-Ferrous Metals Research Association illustrates this. It would be easy to select many other examples. Engineering is characterized by an immediacy—we cannot wait to improve our processes or our products for fifty years, when new theories may have provided a new attack; we must use what we have at hand at the moment in the solution of a practical problem. Nor, to return to the educational process, can we restrict our attention to but one phase of the science that pertains: physics, chemistry, and mechanics (and the accompanying applied mathematics) must all be employed.

The student who has finished undergraduate training may turn to several types of occupations, to plant operation, to management, to sales, or to research. Those who elect research will find (and have found) the training acceptable as preparation for graduate study. A student electing a research career will, of course, further fortify himself in basic science; his increasing knowledge of the behaviour of metals, coupled with advanced study in the basic fields, provides the proper training for the solution of those research problems which may be characterized as metallurgical, judging from the success of men who have had such training; Cottrell himself is a graduate of Birmingham. It seems clear that research in all fields must now be placed primarily in the hands of those who have had advanced training. This, I believe, is one of the answers to the question asked by the leading director of research whom Dr. Hume-Rothery quotes. I should be amazed if a graduate of Birmingham (or of Carnegie!) should have a "smattering of everything and nothing really understood"; it is the deep responsibility of an educator in metallurgy to see that this is not so, and it is quite possible for him to succeed. If the director of research wishes to employ a man for advanced research, he should seek a candidate with advanced training; and if he wishes a man trained in chemistry, or in physics, rather than one trained in metallurgy, then obviously he should employ a chemist or a physicist; as an educator I do not believe that the question asked by the director of research would trouble me so much.

Perhaps it need not be said that all this argument in no way deprecates the importance of those who specialize in the physics of metals; their contributions are deeply important—as are those in physical chemistry, and those in mechanics. Metallurgy

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needs such men, even badly (as physics needs the mathematician ; biophysics, the physicist, &c.) and some universities should provide such training. But the physics of metals, as Dr. Hume-Rothery interprets it, is but one of the many branches of metallurgy. If the metallurgist is to be useful in industry—his natural habitat—then metallurgical education should and must be broad, in the sense I have tried to suggest ; it must not preoccupy itself disproportionately with specialities. Any narrowly specialized point of view, if regarded seriously by those in charge of educational policy, would be most unfortunate.

ROBERT FRANKLIN MEHL.

Department of Metallurgical Engineering,
Carnegie Institute of Technology,
Pittsburgh, Pa.

2 September 1949.

INSTITUTE NEWS AND ANNOUNCEMENTS

NEW EDITOR OF PUBLICATIONS

MAJOR W. G. ASKEW, M.C., having resigned his post as Assistant Editor to become Editor of *Chemistry and Industry*, the Council has appointed Mr. N. B. VAUGHAN, M.Sc., F.I.M., to fill the vacancy.

On the recommendation of the Secretary, Mr. Vaughan has been appointed Editor of the Institute's publications. Such a change was visualized by the Council in 1947, as announced in the Report of Council for that year, in order that the Secretary should be free to devote a greater amount of his time to developing the Institute's services.

Mr. Vaughan, whose duties will be concerned with the production (not the sale) of the Institute's publications, has previously served on the staff of the Institute. Prior to the war he held the post of Assistant Editor, and during the war (in the Editor's absence) he had full charge of the Editorial Department.

ADVERTISEMENTS

An arrangement has been reached between the Councils of the Iron and Steel Institute and the Institute of Metals whereby Mr. E. R. MORT, B.Sc., F.I.M., will be responsible for advertisements in the *Journal of the Institute of Metals*. Enquiries regarding rates, &c., should be addressed to him personally at the Advertisement Department, 4 Grosvenor Gardens, London, S.W.1 (Telephone : SLOane 6233).

DISCUSSION BY CORRESPONDENCE

Members are reminded that any written discussion of papers published in the Institute's *Journal* up to and including the August 1949 issue, should reach the Editor not later than 31 October 1949.

NEWS AND ANNOUNCEMENTS

ELECTION OF ORDINARY MEMBERS AND STUDENT MEMBERS

The following 23 Ordinary Members and 10 Student Members were elected on 1 September 1949 :

As Ordinary Members

- BELLIER, Alfred, Ing. Civil des Mines, General Secretary, Société des Mines et Fonderies de Zinc de la Vieille Montagne, 19 rue Richer, Paris 9e, France.
- BRAATEN, Amund, Works Manager, Standard Telefon og Kabel-fabrik A/S., P.O. Box 749, Oslo, Norway.
- CARON, Maurice Clément Casimir, Director, Compagnie Royale Asturienne des Mines, 196 avenue Victor Hugo, Paris 16, France.
- DANNENMULLER, Marc André Jean, Ing. Civil des Mines, Directeur de l'Usine de la Compagnie Française de l'Etain, Annecy (Haute Savoie), France.
- HALE, George Ernest, Technical Engineer, Martin Burn, Ltd., 71 Queen Street, London, E.C.4.
- KUBASCHEWSKI, Oswald, Dr. phil., Research Scientist, Ministry of Supply, National Physical Laboratory, Teddington, Middlesex.
- LUND, Herman Schröder, Managing Director, AB Svenska Aluminiumkompaniet, Kungsgatan 28, Stockholm, Sweden.
- MADDEN, Robert C., S.B., Superintendent, Metallurgical Department, Kaiser Company, Inc., P.O. Box 217, Fontana, Cal., U.S.A.
- MEAD, Dexter H., Supervisor of Methods, Revere Copper and Brass, Inc., 2200 North Natchez Avenue, Chicago 35, Ill., U.S.A.
- MURFITT, George, Works Manager, Metals and Methods, Ltd., Bacon Works, Langley, near Slough, Buckinghamshire.
- OSKARSON, Valde, Chief Engineer, AB Svenska Aluminiumkompaniet, Kungsgatan 28, Stockholm, Sweden.
- PATANKAR, Muralidhar V., B.Sc., Lecturer in Physical Metallurgy, Indian Institute of Science, Bangalore, India.
- PATELL, Dorab Pheroze, B.E., Assistant Engineer, The Associated Cement Companies, Ltd., 1 Queen's Road, Bombay, India.
- PILLANS, Charles Stuart Mortimer, Chairman and Managing Director, West Rand Engineering Works (Pty.), Ltd., Little Birmingham, Krugersdorp, Transvaal, South Africa.
- RAE, Donald, Personal Assistant to the Managing Director, McKechnie Brothers, Ltd., Rotton Park Street, Birmingham 16.
- RENDALL, John Howard, B.Sc., A.R.S.M., Senior Scientific Officer, Metallurgy Division, National Physical Laboratory, Teddington, Middlesex.
- RIVIÈRE, Jaime, Director Adjunto, Fábrica de Mieres, S.A., Apartado No. 20, Mieres (Asturias), Spain.
- ROBINSON, Ronald William, Senior Experimental Officer, Royal Naval Scientific Service, Metallurgical Laboratory, Engineering Department, H.M. Dockyard, Malta, G.C.
- SANDBERG, Sverre, Transmission Line Engineer, AB Svenska Aluminiumkompaniet, Kungsgatan 28, Stockholm, Sweden.
- SMITH, Samuel A., Ph.B., M.E., Vice-President, General Cable Corporation, Bayonne, N.J., U.S.A.

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- STEPHEN, Russell Duncan, Metallurgist, Delfos, Ltd., Lincoln Road, Industrial Sites, Benoni, Transvaal, South Africa.
TAYLOR, Abraham, M.Sc., Ph.D., Physicist, The Mond Nickel Company, Ltd., Wiggin Street, Birmingham 16.
THOMPSON, Arthur Howard, Managing Director, General Galvanizers, Ltd., Wolverhampton.

As Student Members

- BYER, Kenneth George William, Assistant Experimental Officer, Royal Naval Scientific Service, Metallurgical Laboratory, Engineering Department, H.M. Dockyard, Malta, G.C.
CORDNER, George Denis, Research Scholar, University of Melbourne, Melbourne, Vic., Australia.
DARWIN, George Erasmus, B.A., Technical Assistant to the Managing Director, Compound Electro Metals, Ltd., 42 Pall Mall, London, S.W.1.
GIBLIN, John Francis, B.Eng., Metallurgist, British Insulated Callender's Cables, Ltd., Prescott, Lancashire.
HERBST, Noel Frederick, Student of Metallurgy, University of Melbourne, Melbourne, Vic., Australia.
HINES, John, Student of Metallurgy, Coventry Technical College, Coventry.
JAYARAMAN, A., B.Sc., Research Student (mail): Maratturai P.O., Via Kuttalam, Tanjore District, South India.
QUASS, Stanley Thomas, B.Met.E., Research Student, Metallurgy Department, Melbourne University, Melbourne, Vic., Australia.
SAINSBURY, George Stratford, Spectrographer, J. Stone and Company, Ltd., Charlton, London, S.E.7.
SAWKILL, John, B.Sc., Research Student, Physics Department, King's College (University of Durham), Newcastle-upon-Tyne.

PERSONALITIES

PROFESSOR LESLIE AITCHISON, D.Met., M.Sc.

PROFESSOR LESLIE AITCHISON, who has been elected an Honorary Member of the Institute of Metals, was a student under Professor J. O. Arnold in the Metallurgical Department at Sheffield University, and after graduation was awarded a Research Fellowship at Sheffield. He then served in the steel industry for a short time, afterwards returning to Sheffield University as lecturer and demonstrator in metallurgy. During the next few years he published a number of papers, mainly dealing with his research on corrosion problems, and was awarded the D.Met. degree for this work. He also collaborated with the late Dr. F. Ibbotson in writing "The Analysis of Non-Ferrous Alloys", a text-book which was very widely adopted.

During the first World War, Dr. Aitchison was commissioned as a Lieutenant, R.N.V.R., being appointed to the Air Division, and thus commenced his long association with aeronautics and aeronautical materials. He worked in the Technical Section of the Royal Naval Air Service, and when this service was fused with the Royal Flying Corps he became the metallurgist to the Air Board and later, on its creation, to the Air Ministry. After the

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conclusion of the war the Air Ministry retained him as consultant on metallic materials, a position which he held until 1924. In the same period, he acted as consultant to various aircraft and aero-engine builders, as well as to drop forgers and automobile manufacturers. During these years, he was very intimately engaged in the preparation of British Standard Specifications for all types of metallic materials. He was concerned mostly with those for aircraft and automobiles, and was Chairman of a large number of the committees of the British Standards Institution dealing with steel, light alloys, and other non-ferrous materials. During the same period, he was closely associated also with the Aeronautical Research Committee, a connection which still continues.

In 1924, Dr. Aitchison became Superintendent of the Company to Messrs. James Booth and Company, Ltd., of Birmingham. He held this position for twenty years and was deeply concerned in the striking growth of the light alloy industry of this country. During his connection with it, this industry made phenomenal strides and multiplied its production and capacity very many times. When the Wrought Light Alloys Association was formed, he was appointed Chairman of its Executive Committee as well as of its Technical Committee, and he held both these positions until he retired from industrial service. During all the time he was with Messrs. James Booth



and Company, Ltd., he continued active work in connection with standardization, though he naturally concentrated his attention on non-ferrous materials, both heavy and light. His contacts with the work of the Aeronautical Research Committee were also maintained.

In 1944, Dr. Aitchison, for reasons of health, was compelled to retire from active work in industry and, after a time, became a Fellow of Birmingham University. He devoted himself to the development of the teaching of Industrial Metallurgy. This was a new departure in academic circles, and the University of Birmingham came to think so well of it that a Chair of Industrial Metallurgy was founded of which Professor Aitchison became the first occupant. He has recently been compelled to relinquish this position because of ill-health.

In addition to his membership of a number of committees of the Aeronautical Research Council and Department of Scientific and Industrial Research, he has been closely associated in the past few years with official metallurgical research in connection with aeronautics and the air services. When the Government decided to establish the Inter-Services Metallurgy Research Council, Professor Aitchison became the first Chairman, and took a considerable part in the launching of this new and important venture.

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In 1947, he was appointed Chairman of the Joint Committee on Metallurgical Education. Until recently he was a Member of the Council of the Institute of Metals, and a Member of Council of the Royal Aeronautical Society, being also Chairman of the Materials Committee of that Society.

During Professor Aitchison's period as consultant after the first war, he published his well known text book on "Engineering Steels", and with the late Mr. W. R. Barclay a corresponding volume on "Engineering Non-Ferrous Metals and Alloys". He published a considerable number of papers in that same period, many of them dealing with his original work on fatigue, alloy steels, and light alloys. In 1924, he was awarded the Crompton Medal by the Institution of Automobile Engineers, and in the following year the Smith's Prize by the same Institution. In 1934, the Simms Gold Medal was awarded to him by the Royal Aeronautical Society, in recognition of his work on aeronautical materials, and he received a second award of the Simms Gold Medal in 1947. He is the only person who has received this award on two occasions.

Professor Aitchison was elected a member of the Institute of Metals in 1918, and served on the Council from 1947 until the present year. He is a member of the Institution of Mechanical Engineers, a Fellow of the Royal Institute of Chemistry, a Fellow of the Royal Aeronautical Society, and a Fellow of the Institution of Metallurgists.

SIR CLIVE BAILLIEU, K.B.E., C.M.G., M.A.

SIR CLIVE LATHAM BAILLIEU, who was recently elected an Honorary Member of the Institute of Metals, was born at Melbourne, Australia, on 24 September 1889. He is the eldest son of the late Hon. William Lawrence Baillieu of Melbourne, Australia, and he married in 1915 Ruby, only daughter of the late William Clark formerly of Windlesham Moor, Windlesham, Surrey, and has three sons and one daughter. He was educated at the Church of England Grammar School, Melbourne; Trinity College, Melbourne University; and Magdalen College, Oxford.

After obtaining his M.A. degree at Oxford, Sir Clive was called to the Bar of the Inner Temple in January 1914, and then returned to Australia. In 1915 he joined the Australian Imperial Forces and served with them in Egypt and France, being mentioned in despatches and receiving the award of the O.B.E. Towards the end of 1918, as a Major in the Australian Imperial Forces, he transferred to the Royal Air Force with the temporary rank of Lieutenant-Colonel. He was representative of His Majesty's Government in the Commonwealth of Australia on the Imperial Communications Advisory Committee from 1929 to 1939, and from 1930 to 1947 was one of the Australian representatives on the Imperial Economic Committee.

For many years Sir Clive was closely associated with his late father, the Hon. W. L. Baillieu, and Mr. W. S. Robinson in the direction of various non-ferrous mining and smelting companies in the United Kingdom and Australia. He succeeded the late Viscount Horne of Slamannan as Chairman of the Imperial Smelting Corporation, Ltd., the Zinc Corporation, Ltd., and New Broken Hill Consolidated, Ltd., but retired as Chairman on his appointment as Director-General of the British Purchasing

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Commission in the United States. When the Export Council was formed by Sir Andrew Duncan in 1940, Sir Clive was appointed an Executive Member of the Council, together with the late Sir Francis D'Arcy Cooper, Sir Samuel Beale, Lord Hyndley, and Sir Cecil Weir.

In January 1941 Sir Clive was appointed Director-General of the British Purchasing Commission in the United States, in succession to Mr. Arthur B. Purvis, and a member of the British Supply Council in North America. In January 1942 he was appointed Head of the British Raw Materials Mission and the British Representative on the Combined Raw Materials Board. After his return to England in November 1943, at the invitation of the Board of the Fairey Aviation Company and at the request of the Minister of Aircraft Production, Sir Clive agreed to act as Chairman of the Company during the absence abroad on official duties of Sir Richard Fairey.

He was Chairman of the Departmental Committee on the establishment of a Central Institute of Management in 1946; a member of the first Council of the British Institute of Management in 1947; a member of the National Production Advisory Council on Industry and the National Investment Council from 1946 to 1948; headed the British Trade Mission to the Argentine in 1947 and 1948, which concluded the Andes Agreement; and was a member



of the General Advisory Council of the B.B.C. From 1945 to 1949 he was Deputy Chairman of the Dunlop Rubber Company, Ltd.

Sir Clive is now Chairman of the Dunlop Rubber Company, Ltd., and of Central Mining and Investment Corporation, Ltd.; a Director of the Midland Bank, Ltd., Consolidated Zinc Corporation, Ltd., and the English, Scottish and Australian Bank, Ltd. He is an Honorary Member of the Australasian Institute of Mining and Metallurgy.

He is deeply interested in Anglo-American relations. He was formerly Chairman of the American and British Commonwealth Association. When this body was incorporated with the E.S.U., he became Deputy-Chairman of the English-Speaking Union.

Sir Clive was elected a member of the Institute of Metals in 1935, and served as a Member of Council from 1943 to 1947.

PERSONAL NOTES

MR. A. G. ADLINGTON has left for South Africa, as the holder of a Nuffield Post-Graduate Travelling Scholarship. He is to visit copper, lead, zinc, and gold mines, and smelters in the Union of South Africa and in the Rhodesias, and will return at the end of February.

MR. C. ANDERSON completed Part II of the Natural Science Tripos in Metallurgy at Cambridge in June, and has taken up the appointment of Personal Assistant to the General Manager of Stewarts and Lloyds, Ltd., Corby.

MR. G. D. ATKINSON has graduated from Durham University with a pass degree in metallurgy, and has joined the staff of the National Smelting Co., Ltd.

MR. J. G. BALL has resigned from his position as Senior Metallurgist of the British Welding Research Association to take up an appointment as a Principal Scientific Officer at the Atomic Energy Establishment (Ministry of Supply), Harwell.

MR. G. R. BELL has recently joined F. W. Beck and Co., Ltd., Abbey Mills Chemical Works, Ltd., Stratford, London, E.15, as manager of the metal powders section.

MR. P. P. BHATNAGAR has left the Indian Iron and Steel Co., Ltd., and has joined the National Metallurgical Laboratory, Jamshedpur, as a Senior Scientific Officer.

MR. B. J. BISHOP has been appointed an assistant in the Association Department of Peat, Marwick, Mitchell and Co., Lombard House, Great Charles St., Birmingham 3.

MR. H. D. BROOK has been transferred from the Royal Aircraft Establishment, Farnborough, to the Chemical Section, Post Office Electrical Engineering Department, Fordrough Lane, Birmingham 9.

MR. R. A. BUTLER has been awarded the degree of Bachelor of Engineering (in Metallurgy) of Liverpool University and is about to start his period of National Service in the Army.

MR. M. G. COCKCROFT has been awarded the degree of M.Sc. by research in metallurgy at Manchester University.

MR. E. W. COLBECK, Metallurgical and Research Director of Messrs. Hadfields, Ltd., East Hecla Works, Sheffield, has accepted an invitation to become a member of the Inter-Service Metallurgical Research Council.

MR. A. T. COOTE has left the Ever-Ready Company (Great Britain), Ltd., to take up an appointment with John Dale, Ltd., New Southgate, London, N.11.

MR. R. A. DAY has left the Ministry of Supply and has taken up an appointment as a Research Metallurgist with the English Electric Co., Ltd., Stafford.

DR. C. H. DESCH was awarded the degree of Doctor *honoris causa* of mining engineering at the centenary celebrations of the Montanistische Hochschule, Leoben, Austria.

MR. R. J. GOODWIN, who was awarded the B.A. degree of Cambridge University last July, has taken up an appointment as Research Bursar at the British Non-Ferrous Metals Research Association, London.

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MR. P. HEPTONSTALL has taken up an appointment as Assistant Metallurgist with the Park Gate Iron and Steel Co., Ltd., Rotherham, since obtaining his degree at Leeds.

MR. R. W. K. HONEYCOMBE, of the Cavendish Laboratory, Cambridge, has been appointed to an Armourers' and Brasiers' Company research fellowship for two years from 1 October. Mr. Honeycombe will work on the inhomogeneities of plastic deformation in metals and the influence of these inhomogeneities on recrystallization and recovery.

MR. B. T. HOULDEN has been awarded the Ph.D. degree of London University and the Diploma of the Imperial College. He is now an Investigator with the British Non-Ferrous Metals Research Association, London.

MR. JOHN V. LYONS has been awarded the degree of Ph.D. (industrial metallurgy) of Birmingham University.

MR. H. G. MASLIN has resigned from the South Rhodesia Civil Service and has taken up a post with Roan Antelope Copper Mines, Ltd. His new address is P.O. Box 36, Luanshya, Northern Rhodesia.

MR. P. H. NUNN has recently been awarded the degree of B.Sc. in Metallurgy of King's College, Newcastle-on-Tyne (University of Durham).

MR. M. S. PATERSON, who was recently awarded the degree of Doctor of Philosophy of Cambridge University for work on X-ray line broadening in cold-worked metals, has now returned to his former position at the Department of Supply and Development, Division of Aeronautics, Melbourne, Australia.

DR. GEORGE SACHS has resigned his post as Director of the National Metallurgical Laboratory, Jamshedpur, India, and has returned to the United States. His address is 2177 South Overlook Road, Cleveland 6, Ohio.

MR. H. H. SYMONDS has been elected a Fellow of the Institution of Metallurgists.

MRS. C. F. TIPPER has been appointed a Reader in the Engineering Department of Cambridge University and will take up her duties with effect from October; she is on a visit to the United States until November. Mrs. Tipper was recently awarded the degree of Doctor of Science of Cambridge University.

DR. A. J. P. TUCKER, who was awarded the degree of Doctor of Philosophy in the University of Cambridge for his thesis on "Corrosion and Film Formation" and also took his Master of Arts degree in February of this year, is now working under Dr. N. P. Inglis in the Metallurgical Section of Imperial Chemical Industries, Ltd., Billingham Division, Billingham, Co. Durham.

MR. R. F. TYLECOTE has been awarded an I.C.I. Fellowship at London University and will take up his appointment, on 1 October, at the Department of Metallurgy, Imperial College of Science and Technology, South Kensington, London, S.W.7.

MR. F. E. WALKER has been awarded the degree of B.Sc. of the University of Wales and has taken up an appointment as Technical Assistant with the Bristol Aeroplane Co., Ltd., at Bristol.

OTHER NEWS

BEILBY MEMORIAL AWARDS

From the interest derived from the invested capital of the Sir George Beilby Memorial Fund, at intervals to be determined by the administrators, representing the Royal Institute of Chemistry, the Society of Chemical Industry, and the Institute of Metals, awards are made to British investigators in science to mark appreciation of records of distinguished work. Preference is given to investigations relating to the special interests of Sir George Beilby, including problems connected with fuel economy, chemical engineering, and metallurgy, and awards are made, not on the result of any competition but in recognition of continuous work of exceptional merit, bearing evidence of distinct advancement in science and practice.

In general, awards are not applicable to workers of established repute, but are granted as an encouragement to younger men who have done original independent work of exceptional merit over a period of years. In recent years the amount of each award has commonly been 100 guineas.

Consideration will be given to the making of an award or awards from the Fund early in 1950, and the administrators will therefore be glad to have their attention drawn to outstanding work of the nature indicated, not later than 31 December 1949.

All communications on this subject should be addressed to the Convener, Administrators of the Sir George Beilby Memorial Fund, Royal Institute of Chemistry, 30 Russell Square, London, W.C.1.

THE CHEMICAL SOCIETY RESEARCH FUND

The Research Fund of the Chemical Society provides grants for the assistance of research in all branches of Chemistry. About seven hundred pounds per annum is available for this purpose, the income being derived from a donation of the Worshipful Company of Goldsmiths, from the Perkin Memorial Fund, and from other sources.

Applications for grants will be considered in November next, and should be submitted on the appropriate form not later than Tuesday, 1 November 1949. Applications from Fellows will receive prior consideration.

Forms of application, together with the regulations governing the award of grants, may be obtained from the General Secretary, The Chemical Society, Burlington House, Piccadilly, London, W.1.

DIARY FOR OCTOBER

LOCAL SECTIONS MEETINGS

THURSDAY, 6 OCTOBER

Birmingham Local Section.—Discussion of two papers published in the *Journal of the Institute of Metals*, Jan. 1949. M. Cook and N. F. Fletcher, "The Melting and Casting of Brass"; E. J. Bradbury and P. G. Turner, "The Melting and Casting

NEWS AND ANNOUNCEMENTS

of Nickel Silver at the Works of Henry Wiggin and Co., Ltd.” (James Watt Memorial Institute, Gt. Charles St., Birmingham, at 6.30 p.m.)

MONDAY, 10 OCTOBER

Scottish Local Section.—Visit to the Royal Naval Torpedo Factory, Alexandria.

TUESDAY, 11 OCTOBER

South Wales Local Section.—Harry Davies, “Fire-Refining and Casting of Copper”. (University College, Singleton Park, Swansea, at 6.30 p.m.)

THURSDAY, 13 OCTOBER

London Local Section.—Dr. H. M. Finnieston, “Metallurgical Applications of Radio-Active Isotopes”. (4 Grosvenor Gardens, London, S.W.1, at 7 p.m.)

THURSDAY, 20 OCTOBER

Birmingham Local Section.—Dr. A. T. Steer, “The Metallographic Aspect of Electrodeposition”. (James Watt Memorial Institute, Gt. Charles St., Birmingham, at 6.30 p.m.)

THURSDAY, 27 OCTOBER

Sheffield Local Section.—G. Meikle, “Aluminium Alloys in Aircraft”. (Grand Hotel, Sheffield, at 6.30 p.m.)

OTHER MEETINGS

TUESDAY, 4 OCTOBER

Electrodepositors' Technical Society.—Symposium on “The Influence of the Surface Condition of Metals on Electrodeposits”. (James Watt Memorial Institute, Gt. Charles St., Birmingham, 2.15–5 p.m.; 6.30–8.30 p.m. Lunch at Grand Hotel, 10s. 6d.; tea at Grand Hotel, 2s. 6d. Tickets for meals and preprints of papers obtainable from Mr. I. T. Watkins, Westinghouse Brake and Signal Co., Ltd., 41–42 Bradford St., Birmingham 5. Visitors welcome.)

Institution of Engineers and Shipbuilders in Scotland.—Professor Gilbert Cook, “Presidential Address”. (The Institution 39 Elmbank Crescent, Glasgow, C.2, at 6.30 p.m.)

THURSDAY, 6 OCTOBER

Leeds Metallurgical Society.—Professor H. W. Swift, “Deep-Drawing”. (Chemistry Dept., The University, Leeds 2, at 7 p.m.)

TUESDAY, 11 OCTOBER

Institute of Works Managers, Leicester Branch.—N. F. Hall, “Training for the Higher Executive in Industry”. (College of Technology, The Newarke, Leicester, at 7 p.m.)

Institute of Works Managers, Merseyside Branch.—Professor L. S. Hearnshaw, “Assessment of Aptitudes and Personality”. (Exchange Hotel, Liverpool, at 6.30 p.m.)

NEWS AND ANNOUNCEMENTS

Institute of Works Managers, West Midland Branch.—J. Wilson, "Management Education : its Scope and Limitations". (Grand Hotel, Birmingham, at 7 p.m.)

Institution of Mechanical Engineers, Automobile Division.—Annual General Meeting. Address by the Chairman. (The Institution, Storey's Gate, London, S.W.1, at 5.30 p.m.)

THURSDAY, 13 OCTOBER

Institute of Works Managers, Bristol Branch.—A. P. Young, "Teamwork and Productivity". (Royal Hotel, Bristol, at 7.15 p.m.)

Institute of Works Managers, Wembley Sub-Branch.—I. H. Child, "Practical Motion Study". (Rest Hotel, Kenton, at 12.30 p.m.)

FRIDAY, 14 OCTOBER

Chemical Society.—Dr. Kathleen Lonsdale, "Diffraction of Neutrons by Crystals". Joint meeting with University College of Exeter Scientific Society. (Washington Singer Laboratories, Prince of Wales Road, Exeter, at 5 p.m.)

Institute of Works Managers, Manchester Branch.—L. J. Edwards (Parliamentary Secretary to the Board of Trade), "Our Economic Prospect". (Grand Hotel, Manchester, at 6.30 p.m.)

MONDAY, 17 OCTOBER

Electrodepositors' Technical Society, London Centre.—A. E. J. Pettet, "The Disposal of Plating Shop Effluents". (Northampton Polytechnic, St. John St., Clerkenwell, London, E.C.1, at 6 p.m.)

Institute of Works Managers, Sheffield Branch.—D. G. Petrie, "Production Planning". (Royal Victoria Station Hotel, Sheffield, at 7 p.m.)

WEDNESDAY, 19 OCTOBER

Institute of Works Managers, Tees-Side Branch.—A. P. Young, "Teamwork and Productivity". (Vane Arms Hotel, Stockton-on-Tees, at 7.30 p.m.)

Institute of Welding, West of Scotland Branch.—W. K. B. Marshall, "Recent Developments in the Welding of Aluminium Alloys". (Institution of Engineers and Shipbuilders in Scotland, 39 Elmbank Crescent, Glasgow, C.2, at 7 p.m.)

THURSDAY, 20 OCTOBER

Institution of Mechanical Engineers.—Annual Dinner. (Dorchester Hotel, Park Lane, London, W.1, at 7 for 7.30 p.m.)

Institution of Mining and Metallurgy.—General Meeting. (Geological Society of London, Burlington House, Picadilly, London, W.1, at 5 p.m.)

FRIDAY, 21 OCTOBER

Institution of Mechanical Engineers.—General Meeting. President's Address. (The Institution, Storey's Gate, London, S.W.1, at 5.30 p.m.)

NEWS AND ANNOUNCEMENTS

West of Scotland Iron and Steel Institute.—W. Barr, “Presidential Address”. (Institution of Engineers and Shipbuilders in Scotland, 39 Elmbank Crescent, Glasgow, C.2, at 6.45 p.m.)

SUNDAY, 23 OCTOBER, TO SUNDAY, 30 OCTOBER

XXLLe. Congrès International de Chimie Industriel, Barcelona. (Address of permanent organization of the Congress, 28 Rue Saint-Dominique, Paris 7e, France.)

MONDAY, 24 OCTOBER

Institute of Works Managers, Glasgow Branch.—E. M. Ackery, “Miscellaneous Applications of Electrical Heat in Industry”. (Institution of Engineers and Shipbuilders in Scotland, 39 Elmbank Crescent, Glasgow, C.2, at 7 p.m.)

TUESDAY, 25 OCTOBER

Institute of Welding.—O. V. S. Bulleid, “Presidential Address”. (11 Upper Belgrave St., London, S.W.1, at 6.30 p.m.)

WEDNESDAY, 26 OCTOBER

Manchester Metallurgical Society.—Dr. D. Binnie, Presidential Address on “Problems Raised from the Study of Steel Ingots”. (Engineers’ Club, Albert Sq., Manchester, at 6.30 p.m.)

THURSDAY, 27 OCTOBER

Chemical Society.—Dr. J. S. Anderson, “The Chemistry of Metallic Oxides”. (Chemistry Department, University College, Dundee, at 5 p.m.)

Chemical Society.—Dr. R. S. Cahn, “Editing for the Chemical Society”. (Chemistry Lecture Theatre, The University, Liverpool, at 4.30 p.m.)

APPOINTMENT REQUIRED

METALLURGICAL ENGINEER, qualified, well connected, young and energetic, desires to represent in India first-class manufacturers of metals and manufactured metal goods, industrial and domestic. Special interests aluminium and other light metals and their products. Please write to: Balram K. Sood, 2 Keeling Road, New Delhi, India.

APPOINTMENTS VACANT

To conform to the requirements of the Control of Engagements Order, 1947, these advertisements are published for the information only of those who are “excepted persons” under the Order.

A VACANCY exists for a GRADUATE METALLURGIST in an interesting and progressive post involving duties of a general and metallurgical nature in the production departments of a factory producing aluminium extrusions and rolled products. An honours degree and works experience are desirable. Candidates, who should not be more than 30 years of age, are asked to apply in writing, giving full details of age, education, qualifications, and experience to: The Manager, The British Aluminium Co., Ltd., Bank Quay, Warrington, Lancs.

NEWS AND ANNOUNCEMENTS

APPLICATIONS are invited for appointment to an unestablished post of **CHEMIST-IN-CHARGE** at a Ministry of Supply Factory in Co. Durham.

Candidates should have an honours degree in Chemistry, Metallurgy, Physics, or Engineering, or Associateship of the Royal Institute of Chemistry, the Institution of Metallurgists, or the Institute of Physics, and experience in a factory or industrial laboratory; or corporate membership of the Institution of Chemical Engineers. They should have had experience or knowledge of the manufacture and hot- and cold-rolling of 70:30 brass and preparation of solid drawn components therefrom; the heat-treatment of special steels used for making draw tools, dies, and punches—for cold and hot draw press work; some knowledge of hot draw press work in steel; and be able to initiate investigations into behaviour and use of aluminium alloys.

The successful candidate will be required to take charge of the chemical, metallurgical, and testing laboratories at the factory.

The salary for the post will be assessed according to qualifications and experience within the range £720-£960 per annum inclusive.

Candidature will normally be confined to natural-born British subjects born within the United Kingdom, or in one of the self-governing Dominions, of parents similarly born.

Write quoting F.578/49A to Ministry of Labour and National Service, Technical and Scientific Register, K, York House, Kingsway, London, W.C.2, for application form which should be returned by 30 September 1949.

ASSISTANT METALLURGIST required for a light engineering company in West London, with experience, if possible, in pressure die-casting of light alloys and in general light engineering metallurgical problems. Inter B.Sc. or equivalent standard preferred, but a young man who has served an engineering apprenticeship and has a knowledge of metallurgy might be suitable. Salary £300-£400 per annum. Apply in writing to Box No. 280, Institute of Metals, 4 Grosvenor Gardens, London, S.W.1.

ASSISTANT METALLURGISTS (Two), age 25-30, required by firm with modern works in South Wales, for control and development work in the fabrication of aluminium and aluminium alloys. Previous works' experience an advantage. Reply, stating age, qualifications, and experience to Box No. 276, Institute of Metals, 4 Grosvenor Gardens, London, S.W.1.

ENGLISH ELECTRIC require experienced Senior Research Metallurgist for work in their laboratories at Stafford. Apply, quoting Ref. 244 and stating salary required, to Central Personnel Service, English Electric Co., Ltd., 24-30 Gillingham Street, Westminster, London, S.W.1.

FUNDAMENTAL RESEARCH IN PHYSICAL METALLURGY. A vacancy exists in this Laboratory for an experienced research worker in physical metallurgy or a related branch of physics or physical chemistry. Enquiries, accompanied by relevant particulars, should be addressed to The Manager, Associated Electrical Industries Research Laboratory, Aldermaston Court, Aldermaston, Berks.

SENIOR METALLURGIST required by firm with modern works recently established in South Wales. Preference will be given to candidates with a University degree and practical experience in the wrought aluminium industry. Age 30-40; commencing salary approximately £800 per annum. Reply, stating age, qualifications, and experience, to Box No. 275, Institute of Metals, 4 Grosvenor Gardens, London, S.W.1.

SPECTROGRAPHER required by Manchester research laboratory. Candidates must have industrial experience and a sound theoretical knowledge. Applications, stating details of age, education, training, qualifications, and experience to: Secretary, Magnesium Elektron, Ltd., Clifton Junction, near Manchester.

TECHNICAL ASSISTANT to Manager of Department producing metal powders required for East London works. Scientific training to at least Inter. standard. The job is interesting and comprises the operation of metallurgical furnaces melting non-ferrous alloys, keeping accurate records of plant operation, development of new production methods, and process control by laboratory tests. The applicant should be able to write technical reports and also to carry out and formulate conclusions from patient and systematic work over periods of time. Commencing salary £350-£500 per annum. Reply to Box No. 279, Institute of Metals, 4 Grosvenor Gardens, London, S.W.1.

THE BRISTOL AEROPLANE COMPANY, LIMITED, have vacancies for:

- (a) **METALLURGIST**, having previous industrial experience in the technical control of heat-treatment, plating, anodizing, and metal treatment processes;
- (b) **GRADUATE METALLURGIST** as general assistant to the above;
- (c) **TWO GRADUATE CHEMISTS**, one for analytical inorganic work, and one for development work on electrodeposition.

Reply stating age, qualifications, and previous experience to the Staff and Labour Manager Aircraft Division, Filton House, Bristol.

UNIVERSITY OF BIRMINGHAM. An appointment will shortly be made of a **RESEARCH FELLOW IN INDUSTRIAL METALLURGY** to work in the field of plastic deformation of metals by industrial metal working processes. Candidates should possess adequate and suitable academic qualifications, and experience in research. Applications should reach the undersigned not later than 14 October 1949.

The University,
Birmingham 3.
August 1949.

C. G. BURTON,
Secretary.

BULLETIN ANALYTIQUE

Publication of the Centre National de la Recherche Scientifique, France

The *Bulletin Analytique* is an abstracting journal which appears monthly in two parts, Part I covering scientific and technical papers in the mathematical and physical sciences and their applications, Part II the biological sciences.

The *Bulletin*, which started on a modest scale in 1940, with an average of 10,000 abstracts per part, now averages 35,000 to 45,000 abstracts per part. The abstracts summarize briefly papers in scientific and technical periodicals received in Paris from all over the world, and cover the majority of the more important journals in the world scientific press. The scope of the *Bulletin* is constantly being enlarged to include a wider selection of periodicals.

The *Bulletin* thus provides a valuable reference book both for the laboratory and for the individual research worker who wishes to keep in touch with advances in subjects bordering on his own.

A specially interesting feature of the *Bulletin* is the microfilm service. A microfilm is made of each article as it is abstracted, and negative microfilm copies or prints from microfilm can be purchased from the editors.

The subscription rates for Great Britain are 4000 frs. (£5) per annum for each part. Subscriptions can also be taken out to individual sections of the *Bulletin* as follows:

	<i>frs.</i>	£	<i>s.</i>	<i>d.</i>
Pure and Applied Mathematics—Mathematics— Mechanics	550		14	6
Astronomy—Astrophysics—Geophysics	700		18	0
General Physics—Thermodynamics—Heat— Optics—Electricity and Magnetism	900	1	2	6
Atomic Physics—Structure of Matter	325		8	6
General Chemistry—Physical Chemistry	325		8	6
Inorganic Chemistry—Organic Chemistry— Applied Chemistry—Metallurgy	1800	2	5	0
Engineering Sciences	1200	1	10	0
Mineralogy—Petrography—Geology— Palaeontology	550		14	6
Biochemistry—Biophysics—Pharmacology	900	1	2	6
Microbiology—Virus and Phages	600		15	6
Animal Biology—Genetics—Plant Biology	1800	2	5	0
Agriculture—Nutrition and the Food Industries	550		14	6

Subscriptions can be paid directly to the editors: Centre National de la Recherche Scientifique, 18 rue Pierre-Curie, Paris 5ème. (Compte-chèque-postal 2500-42, Paris), or through Messrs. H. K. Lewis & Co., Ltd., 136 Gower St., London, W.C.1.

NOTICE TO AUTHORS OF PAPERS

1. Papers will be considered for publication from non-members as well as from members of the Institute. They are accepted for publication in the *Journal*, and not necessarily for presentation at any meeting of the Institute, and should be addressed to The Editor of Publications, The Institute of Metals, 4 Grosvenor Gardens, London, S.W.1.
2. Papers suitable for publication may be classified as:
 - (a) Papers recording the results of original research ;
 - (b) First-class reviews of, or accounts of, progress in a particular field ;
 - (c) Papers descriptive of works methods, or recent developments in metallurgical plant and practice.
3. Manuscripts and illustrations should be submitted in duplicate. MSS. must be typewritten (*double-line spacing*) on one side of the paper only, and authors are required to sign a declaration that neither the paper nor a substantial part thereof has been published elsewhere. MSS. not accepted are normally returned within 3 months of receipt.
4. Synopsis. Every paper must have a synopsis which, in the case of results of research, should state its objects, the ground covered, and the nature of the results. The synopsis will appear at the beginning of the paper, and should be in a form suitable for use by abstracting organizations.
5. References must be collected at the end of the paper, and each must have a number. Initials of authors must be given, and the Institute's official abbreviations for periodical titles (as used in *Met. Abs.*) must be used where known. References must be set out in the style:

W. Rosenhain, *J. Inst. Metals*, 1923, 30, 3 (i.e. year, volume, page).
6. Illustrations. Each illustration must have a number and description ; only one set of numbers must be used in one paper. The set of *line figures* sent for reproduction must be drawn in Indian ink on smooth white Bristol board, good-quality drawing paper, co-ordinate paper, or tracing cloth, which are preferred in the order given. Co-ordinate paper, if used, must be blue-lined with the co-ordinates to be reproduced *finely* drawn in Indian ink. All lettering and numerals, &c., should preferably be in *pencil*. Figures should be drawn approximately twice the size intended for reproduction. *Photographs* must be restricted in number, owing to the expense of reproduction, and trimmed to the smallest possible of the following sizes, consistent with adequate representation of the subject : 3 in. deep by 4 in. wide (two photomicrographs to a plate) ; 3 in. deep by 2½ in. wide (four to a plate) ; 2 in. deep by 2½ in. wide (six to a plate). Magnifications of photomicrographs must be given in each case. Photographs for reproduction should be loose, not pasted down (and not fastened together with a clip, which damages them), and the figure number should be written on the back of each. Legends should be given to photomicrographs, but lengthy descriptions should be avoided owing to the very limited space available on the plates. Illustrations that are not *essential* to the appreciation of the paper should not be included. Only in exceptional cases will illustrations be reproduced if already printed and readily available elsewhere.
7. Tables or Diagrams. Results of experiments, &c., may be given in the form of tables or figures, *but* (unless there are exceptional reasons) *not both*.
8. Overseas Authors. Authors resident in countries distant from Great Britain are requested to name, if possible, agents in Britain to whom may be referred matters concerning their papers, including proofs for correction. Translations from foreign languages should preferably be accompanied by a copy of the MS. in the language of the author.
9. Offprints. Individual authors are presented with 50, two authors with 70, and three with 90, offprints of their papers (in cover) from the *Journal*. Limited numbers of additional offprints can be supplied at the author's expense if ordered before proofs are passed for press. (Orders should preferably be placed when submitting the MSS.)
10. Prizes for Papers. Each year the following awards are made for papers published in the *Journal* : (a) Capper Pass Award for papers on processes or plant used in the fabrication of non-ferrous metals ; (b) W. H. A. Robertson Medal, and Premium for papers on engineering aspects of non-ferrous metallurgy.

THE INSTITUTE OF METALS

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Sir **ARTHUR SMOUT, J.P.**

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Administrative and Editorial Offices :

4 GROSVENOR GARDENS, LONDON, S.W.1

Telephone :

SLOANE 6233

INSTITUTE NEWS AND ANNOUNCEMENTS

INSTITUTE MEETINGS IN 1950

The 42nd Annual General Meeting of the Institute will be held in London on 29, 30, and 31 March.

The 40th May Lecture will be delivered on 10 May by Dr. H. Roxbee Cox, whose subject will be gas turbines.

The 42nd Annual Autumn Meeting will be held in Bournemouth in September 1950. The exact date has not yet been decided.

Fuller details of all these meetings will be published in the *Journal* in due course.

SYMPOSIUM ON METALLURGICAL APPLICATIONS OF THE ELECTRON MICROSCOPE

As already announced, the Institute is organizing a Symposium on Metallurgical Applications of the Electron Microscope, in association with the Chemical Society, Electron Microscopy Group of the Institute of Physics, Faraday Society, Institution of Electrical Engineers, Iron and Steel Institute, Physical Society, and Royal Microscopical Society.

It will be held in the Lecture Theatre of the Royal Institution, 21 Albemarle Street, London, W.1, on Wednesday, 16 November 1949, beginning at 10 a.m. and continuing at 2.30 p.m.

The following is a list of the papers to be discussed :

- 1193. "The Application of the Electron Microscope in Metallography." By Dr. N. P. Allen.
- 1194. "Electron Microscopy in Metallurgy." By Professor Pierre Grivet.
- 1195. "The Use of the Electron Microscope in Metallurgical Research in Germany During and Since the War." By Dr.-Ing. H. Mahl.
- 1196. "The Structure of Some Non-Ferrous Alloys as Revealed by the Electron Microscope." By Dr. G. L. J. Bailey and Miss Sheila Vernon-Smith.
- 1197. "A Replica Technique for the Examination of Fracture Surfaces with the Electron Microscope." By Dr. J. Nutting and Dr. V. E. Cosslett.

NEWS AND ANNOUNCEMENTS

1198. "The Dry Stripping of Formvar Replicas from Etched Metal Surfaces." By Dr. J. Nutting and Dr. V. E. Cosslett.
1199. "The Microstructure of a Water-Quenched Carburized Iron." By Mr. J. Trotter, Mr. D. McLean, and Dr. C. J. B. Clews.
1200. "Electron Microscopy of Light Metal Alloys." By Mr. Fred Keller.
1201. "Some Observations on the Age-Hardening Process in an Aluminium-Copper Alloy." By Mr. G. L. Bucknell and Dr. G. A. Geach.
1202. "Elementary Slip Processes in Aluminium as Shown by the Electron Microscope." By Dr. Arthur F. Brown.
1203. "Studies in the Electron Microscopy of Nickel-Chromium Alloys." By Mr. B. S. Cooper and Mr. G. A. Bassett.
1204. "A Note on the Examination of Metal Powders by the Electron Microscope." By Mr. J. I. Morley.

Papers 1193-1198 will be discussed at the morning session, when Dr. V. E. Cosslett of the Cavendish Laboratory will act as rapporteur; papers 1199-1204 will be discussed in the afternoon session, when Dr. N. P. Allen, Superintendent of the Metallurgy Division, National Physical Laboratory, will act as rapporteur.

All the papers are available in preprint form, and copies have already been sent to those who requested them. It is intended that the papers and the discussion upon them shall be published as No. 8 in the Institute's Monograph and Report Series.

Two manufacturers of electron microscopes will demonstrate their equipment, and there will be an exhibition of photographs and books dealing with the subject.

SEPARATE COPIES OF PAPERS

As a special service to Institute Members only, separate copies of all papers published in the *Journal* will in future be supplied at a cost of 25s. per annum, post free. Sets of papers will be obtainable only by annual subscription and will be despatched monthly. The service begins with the papers published in the September 1949 issue of the *Journal*, which contained the first of the papers likely to be discussed at the next Annual General Meeting.

The service will be a convenience to those members who wish to avoid taking a number of different issues of the *Journal* to meetings, and also to Librarians. Subscriptions should be sent at once to the Secretary.

SYNOPSIS OF PAPERS

For the benefit of intending authors of papers for the *Journal*, there is published below a "Guide for the Preparation of Synopses", which has been drawn up by the Abstracting Services Consultative Committee as a result of a recommendation made at the Royal Society Scientific Information Conference in July 1948. The Guide has recently been considered and endorsed by the Institute's Publication Committee.

NEWS AND ANNOUNCEMENTS

Guide for the Preparation of Synopses

(1) *Purpose*.—It is desirable that each paper be accompanied by a synopsis, preferably appearing at the beginning. This synopsis is not part of the paper; it is intended to convey briefly the content of the paper, to draw attention to all new information, and to the main conclusions. It should be factual.

(2) *Style of Writing*.—The synopsis should be written concisely and in normal rather than abbreviated English. It is preferable to use the third person. Where possible use standard rather than proprietary terms, and avoid unnecessary contracting.

It should be presumed that the reader has some knowledge of the subject but has not read the paper. The synopsis should therefore be intelligible in itself without reference to the paper; for example, it should not cite sections or illustrations by their numerical references in the text.

(3) *Content*.—The title of the paper is usually read as part of the synopsis. The opening sentence should be framed accordingly and repetition of the title avoided. If the title is insufficiently comprehensive the opening should indicate the subjects covered. Usually the beginning of a synopsis should state the objective of the investigation.

It is sometimes valuable to indicate the treatment of the subject by such words as: brief, exhaustive, theoretical, &c.

The synopsis should indicate newly observed facts, conclusions of an experiment or argument and, if possible, the essential parts of any new theory, treatment, apparatus, technique, &c.

It should contain the names of any new compound, mineral species, &c., and any new numerical data, such as physical constants; if this is not possible it should draw attention to them. It is important to refer to new items and observations, even though some are incidental to the main purpose of the paper; such information may otherwise be hidden though it is often very useful.

When giving experimental results the synopsis should indicate the methods used; for new methods the basic principle, range of operation, and degree of accuracy should be given.

(4) *Detail of Lay-Out*.—It is impossible to recommend a standard length for a synopsis. It should, however, be concise and should not normally exceed 200 words.

If it is necessary to refer to earlier work in the summary, the reference should always be given in the same manner as in the text. Otherwise references should be left out.

When a synopsis is completed, the author is urged to revise it carefully, removing redundant words, clarifying obscurities, and rectifying errors in copying from the paper. Particular attention should be paid by him to scientific and proper names, numerical data, and chemical and mathematical formulæ.

PERSONAL NOTES

PROFESSOR E. N. DA C. ANDRADE, Quain Professor of Physics in the University of London, has accepted an invitation to become Director in the Royal Institution and Resident Professor and Director of the Davy-Faraday Research Laboratory, in succession to Professor E. K. Rideal. He will assume his duties on 1 January 1950.

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MR. D. A. DAVIES has left the Baillieu Laboratory, University of Melbourne, in order to become Research Officer in charge of Instruments in the Division of Industrial Chemistry, C.S.I.R.O., Fisherman's Bend, Australia.

MR. J. G. McMASTER, Lecturer in Metallurgy in the University of Sydney, has been appointed to take charge of the Department of Metallurgy at the Technical College, Port Pirie, which is a branch of the Adelaide School of Mines.

DR. W. A. NAISH, is retiring at the end of the year from the post of Head of the Metallurgical Department at Battersea Polytechnic which he has held since 1939. Dr. Naish, who has been teaching metallurgy in the London area for 40 years, will continue in consulting practice.

MR. G. J. OGILVIE has left the C.S.I.R.O. Division of Tribophysics, Melbourne, to go to the University of Leeds, where he will work with Dr. G. W. Brindley in the field of X-ray diffraction.

SIR ARTHUR SMOUT has been re-elected an Honorary Member of Council of the Chemical, Metallurgical, and Mining Society of South Africa, for the year ending 30 June 1950.

LETTER TO THE EDITOR

METALLURGICAL ANALYSIS

SIR,

We would like to call the attention of your readers to a rather surprising observation which we made in the course of an enquiry into the accuracy of the industrial chemical analysis of metals and alloys.

We were endeavouring to find a general indication of the accuracy which could be expected in routine analytical work on aluminium alloys. The Committee of analysts of ALAR, Ltd. (Association of Light Alloy Refiners), was in the fortunate position of having a considerable volume of evidence which could be evaluated by simple statistical methods. It consisted of analytical results obtained from exchange samples analysed by various laboratories and also from standard samples analysed many times in each laboratory. When plotting the coefficient of variation derived from these results against the concentration of the alloy component determined, it was found that the graphs obtained for various components were so similar that it seemed justifiable to produce one single graph showing the relation between coefficient of variation and concentration for all components (see Fig. A).

Furthermore, we have been able to obtain some figures for the coefficient of variation of analytical results on white metals and bronzes for contents in the same range as in the aluminium alloys. These data when plotted in the same way fitted quite closely into the graph obtained on aluminium alloys.

From our evidence it seems that the practical accuracy obtained in the routine analysis of metals and alloys is, above all other influences, dependent on the concentration of the component determined and much less on the nature of the component or the alloy. If this were confirmed by investigation on a broader basis,

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it would be possible to draw two conclusions from the graph obtained :

(1) It would be possible to judge more reliably than hitherto whether the accuracy of a new analytical method would be satisfactory for routine analysis.

(2) Specifications, especially when the metallurgical limits are not clearly defined, could be drawn up on a more rational basis by avoiding ranges of composition too narrow to permit reasonable analytical control with the accuracy obtainable in practice.

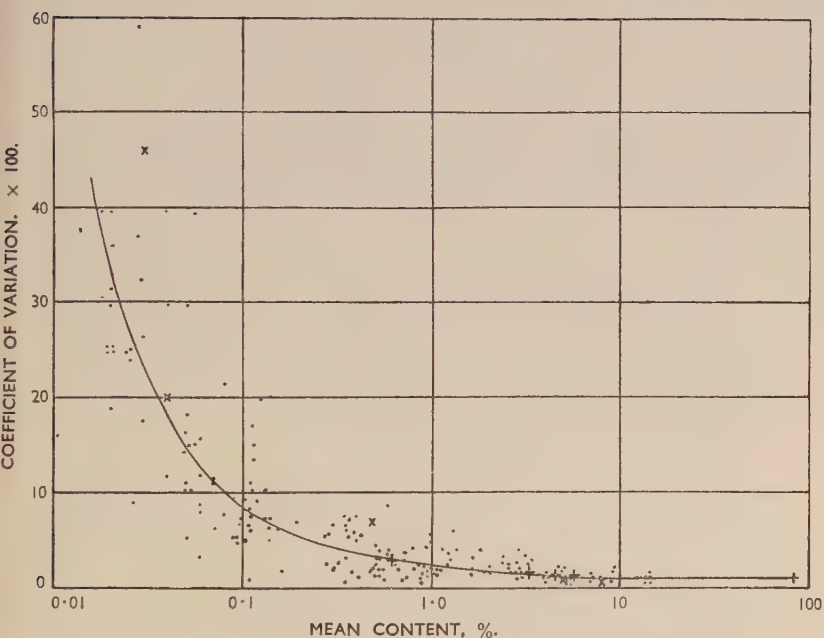


FIG. A.

KEY.

● Aluminium alloys. × White metals. + Bronzes.

It is understood that the Aeronautical Inspection Directorate have for some years used a formula :

$$\text{Tolerance} = \pm \sqrt{K_1(c) + K_2}$$

in assessing the degree of acceptable correspondence between two sets of results (c = concentration and K_1 and K_2 are constants). If the A.I.D. tolerances are now considered as three times the standard variation limits, the agreement with our results is remarkably close.

Any attempt at theoretical explanations of this observation seems to us premature at this present stage, but we think it would be very valuable if our findings could be compared with similar data

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collected in other laboratories in order to obtain evidence on a broad basis.

Details of the investigation will appear in a forthcoming issue of *Metallurgia*.

Yours faithfully,
E. SCHEUER.
F. H. SMITH.

ALAR, Ltd., London, W.1.

4 October, 1949.

OTHER NEWS

AUSTRALIAN INSTITUTE OF METALS

On 9 September the Physical Metallurgy Division of the Melbourne Branch of the Australian Institute of Metals held a successful Symposium on Electrodeposited Metals. The principal authors and their subjects were Mr. A. T. Steer, "The Influence of Base-Metal Surfaces on the Nature and Characteristics of Electrodeposited Metals"; Mr. J. J. Dale, "The Structure of Electrodeposits"; Mr. J. S. Anderson, "Physical and Engineering Problems of Electrodeposits"; Mr. A. G. Sussex, "Electroplated Coatings for Corrosion Protection". This Symposium is the fourth conducted by the Division of the Australian Institute, and the subject for 1949 is the first of a series under the general heading "Surface Treatments for Metals and Alloys". The Committee is soliciting papers on "Impregnation Treatments" for next year's Symposium.

FOURTH INTERNATIONAL ELECTRODEPOSITION CONFERENCE

The 37th Annual Convention of the American Electroplaters' Society which is to be held on 11-15 June 1950, at the Hotel Statler, Boston, Mass., U.S.A., is also to be featured as the Fourth International Electrodeposition Conference with the collaboration of the Electrodepositors' Technical Society of England.

Inquiries regarding reservations and details of the convention may be obtained by writing to the Convention Committee Chairman, Mr. Manson Glover, 376 Washington Street, Malden, Mass., U.S.A., or to the Society's headquarters, P.O. Box 168, Jenkintown, Penna., U.S.A.

Strong technical sessions are being planned, including one session on "A.E.S. Research", symposia sessions on "Smoothing Processes in Metal Finishing", "Mechanical Finishing Processes", and "Advance in Electroforming, including the Graphic Arts", and a fifth session on "Miscellaneous Plating Subjects".

Papers are being solicited for these technical sessions both within the U.S.A. and Canada as well as abroad. As has been the custom in the past, the Editorial Board of the A.E.S. will review all papers submitted in making the selection of those accepted for the programme. Papers not accepted for the convention programme will be considered for publication in the Society's monthly *Plating*. Authors desiring to submit papers are asked to advise promptly the Executive Secretary at the Jenkintown address regarding the

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title of the manuscript. Copies of the Society's bulletins—"Offer Form for Convention Papers", "Regulations Governing Articles and Papers", and "Instructions to Authors"—will be furnished upon request.

Information on hotel reservations and other details of the convention programme will be announced during the winter and spring.

DIARY FOR NOVEMBER

INSTITUTE MEETING

WEDNESDAY, 16 NOVEMBER

Symposium on Metallurgical Applications of the Electron Microscope. (The Royal Institution, Albemarle Street, London, W.1, at 10 a.m. and 2.30 p.m.) For details see p. 19.

LOCAL SECTIONS MEETINGS

TUESDAY, 8 NOVEMBER

South Wales Local Section.—E. H. Bucknall: "Some Aspects of the Flow and Fracture of Metals". (University College, Singleton Park, Swansea, at 6.30 p.m.)

THURSDAY, 10 NOVEMBER

London Local Section.—Dr. C. J. Smithells: "Some Unsolved Problems in the Aluminium Industry". (Royal School of Mines, South Kensington, S.W.7, at 7 p.m.)

MONDAY, 14 NOVEMBER

Scottish Local Section.—J. C. Bailey: "Aluminium and Its Alloys in Relation to Their Use in Building and Civil Engineering". (39 Elmbank Crescent, Glasgow, C.2, at 6.30 p.m.)

THURSDAY, 24 NOVEMBER

Birmingham Local Section.—Students' Evening: a Metallurgical Quiz. (James Watt Memorial Institute, Great Charles Street, Birmingham, at 6.30 p.m.)

FRIDAY, 25 NOVEMBER

Sheffield Local Section.—Dr. A. T. Steer: "The Effect of Cold Working and the Influence of Surface Preparation on the Quality of Silver Deposition". Joint meeting with the Sheffield Branch of the Electrodepositors' Technical Society. (Mappin Hall, Sheffield, at 6.30 p.m.)

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OTHER MEETINGS

TUESDAY, 1 NOVEMBER

Institute of British Foundrymen, Burnley Section.—B. Malone : “ A Mechanized Foundry ”. (Mechanics Institute, Manchester Road, Burnley, at 7.30 p.m.)

THURSDAY, 3 NOVEMBER

Leeds Metallurgical Society.—Dr. N. P. Allen : “ The Development of High-Temperature Alloys during the Last Ten Years ”. (Chemistry Department, The University, Leeds 2, at 7.0 p.m.)

MONDAY, 7 NOVEMBER

Institute of British Foundrymen, Sheffield Branch.—G. L. Harbach : “ The Development of Foundry Sand Control ”. (Royal Victoria Station Hotel, Sheffield, at 7.30 p.m.)

Institution of Electrical Engineers.—Symposium on Ferromagnetic Materials. (The Institution, Savoy Place, Victoria Embankment, W.C.2, at 2.30 and 5.30 p.m.)

TUESDAY, 8 NOVEMBER

Institute of British Foundrymen, Coventry Students' Section.—E. R. Parson : “ The Patternmaker and Foundryman as a Team ”. (Room A5, Coventry Technical College, at 7.15 p.m.)

Institute of British Foundrymen, East Anglian Section.—C. R. van der Ben : “ The Production of Internal Combustion Engine Castings ”. (Central Hall, Public Library, Ipswich, at 7 p.m.)

Institution of Electrical Engineers.—Symposium on Ferromagnetic Materials. (The Institution, Savoy Place, Victoria Embankment, W.C.2, at 2.30 and 5.30 p.m.)

Liverpool Metallurgical Society.—Professor W. J. Kearton : “ The Application of Photoelasticity to Measurement of Stresses ”. (Liverpool University, at 7 p.m.)

WEDNESDAY, 9 NOVEMBER

Institute of British Foundrymen, Lancashire Branch.—S. A. Horton : “ Patternmaking as an Aid to Production Moulding and Core Blowing ”. (Engineers' Club, Albert Square, Manchester, at 7 p.m.)

Manchester Metallurgical Society.—Dr. E. Voce : “ Recent Developments in Copper and Copper Alloys ”. (Engineers' Club, Albert Square, Manchester, at 6.30 p.m.)

THURSDAY, 10 NOVEMBER

Chemical Society.—Professor N. K. Adam : “ Surface Films ”. (Science Lecture Theatre, University College, Hull, at 6 p.m.)

Institute of British Foundrymen, Lincoln Branch.—J. Hill : “ Mechanization ”. (Lincoln Technical College, at 7.15 p.m.)

Institution of Works Managers, Wembley Sub-Branch.—J. C. Cornwell : “ Piercing Diamonds for Drawing Wire ”. (Rest Hotel, Kenton, at 12.30 p.m.)

NEWS AND ANNOUNCEMENTS

Iron and Steel Institute.—Autumn Meeting. (4 Grosvenor Gardens, S.W.1, at 10 a.m. and 2.30 p.m.)

FRIDAY, 11 NOVEMBER

Iron and Steel Institute.—Autumn Meeting. (4 Grosvenor Gardens, S.W.1, at 10 a.m. and 2.30 p.m.)

SATURDAY, 12 NOVEMBER

Institute of Physics, South Wales Branch.—H. P. Rooksby and E. G. Steward: "Industrial Applications of X-Ray Analysis". (University College, Cardiff, at 2 p.m.)

Swansea and District Metallurgical Society.—Dr. Pearson: "Modern Methods of Analysis". (Central Library, Swansea, at 6.30 p.m.)

TUESDAY, 15 NOVEMBER

Institution of Engineers and Shipbuilders in Scotland.—Dr. J. M. A. Lenihan: "Nuclear Physics and the Engineer". (39 Elmbank Crescent, Glasgow, C.2, at 6.30 p.m.)

WEDNESDAY, 16 NOVEMBER

Institute of Welding, West of Scotland Branch.—General Discussion on Difficulties in Welding. (39 Elmbank Crescent, Glasgow, C.2, at 7 p.m.)

THURSDAY, 17 NOVEMBER

Diesel Engine Users' Association.—P. T. Holligan: "Plain Bearings—Material Design and Operation". (Caxton Hall, Westminster, S.W.1, at 2.30 p.m.)

Institute of Physics, Education Group, and Institution of Electrical Engineers.—Discussion on "The Education and Training of Technologists". (The Institution of Electrical Engineers, Savoy Place, Victoria Embankment, W.C.2, at 5.30 p.m.)

Institution of Mining and Metallurgy.—General Meeting. (Geological Society of London, Burlington House, Piccadilly, W.1, at 5.0 p.m.)

SATURDAY, 19 NOVEMBER

Institute of British Foundrymen, East Midlands Branch.—W. P. Smith: "Castings from the Customer's Point of View". (College of Technology, Leicester, at 6 p.m.)

Institution of Works Managers, Sheffield Branch.—Discussion on "Recruitment for Management: University Training versus Shop-Floor Experience". (Royal Victoria Station Hotel, Sheffield, at 3 p.m.)

WEDNESDAY, 23 NOVEMBER

Manchester Metallurgical Society.—Dr. J. C. Chaston: "Powder Metallurgy (other than Carbides)". (Engineers' Club, Albert Square, Manchester, at 6.30 p.m.)

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FRIDAY, 25 NOVEMBER

Chemical Society.—Dr. U. R. Evans : “ Corrosion Inhibitors ”. (Washington Singer Laboratories, Prince of Wales Road, Exeter, at 5 p.m.)

Institute of British Foundrymen, Falkirk Section.—J. F. Dowell and H. London : “ Work in a Jobbing Foundry ”. (Temperance Café, Lint Riggs, Falkirk, at 7 p.m.)

TUESDAY, 29 NOVEMBER

Institute of British Foundrymen, Slough Section.—A. R. Martin : “ Some Notable Aluminium Alloy Castings ”. (Lecture Theatre, High Duty Alloys, Ltd., Slough, at 7.15 p.m.)

Institution of Engineers and Shipbuilders in Scotland.—Cmdr. T. McKenzie : “ Salvage in Peace and War ”. (39 Elmbank Crescent, Glasgow, C.2, at 6.30 p.m.)

APPOINTMENTS VACANT

To conform to the requirements of the Control of Engagements Order, 1947, these advertisements are published for the information only of those who are “ excepted persons ” under the Order.

ASSISTANT METALLURGIST required for a light engineering Company in West London, with experience, if possible, in pressure die-casting of light alloys and in general light engineering metallurgical problems. Inter B.Sc. or equivalent standard preferred, but a young man who has served an engineering apprenticeship and has a knowledge of metallurgy might be suitable. Salary £300–£400 per annum. Apply in writing to Box No. 280, Institute of Metals, 4 Grosvenor Gardens, London, S.W.1.

THE BRISTOL AEROPLANE COMPANY, LIMITED, have vacancies for :

- (a) **METALLURGIST**, having previous industrial experience in the technical control of heat-treatment, plating, anodizing, and metal treatment processes;
- (b) **GRADUATE METALLURGIST** as general assistant to the above;
- (c) **TWO GRADUATE CHEMISTS**, one for analytical inorganic work, and one for development work on electrodeposition.

Reply stating age, qualifications, and previous experience to the Staff and Labour Manager, Aircraft Division, Filton House, Bristol.

COVENTRY ENGINEERING COMPANY have vacancy for **METALLURGIST** holding B.Sc. or equivalent qualification. Age 22–33. Applicant should have a sound knowledge of ferrous and non-ferrous metallurgy. A knowledge of powder metallurgy and/or ceramics would be an advantage. Position offered is of a progressive nature. Commencing salary (depending on qualifications and experience) £300–500 per annum. Box 282, Institute of Metals, 4 Grosvenor Gardens, London, S.W.1.

TECHNICAL ASSISTANT TO MANAGER of Department producing metal powders required for East London Works. Scientific training to at least Inter. standard. The job is interesting, and comprises the operation of metallurgical furnaces, melting non-ferrous alloys, keeping accurate records of plant operation, development of new production methods, and process control by laboratory tests. The applicant should be able to write technical reports and also carry out and formulate conclusions from patient and systematic work over periods of time. Commencing salary £350–£500 per annum. Box No. 279, Institute of Metals, 4 Grosvenor Gardens, London, S.W.1.

ZINC OXIDE TECHNICAL MANAGER for full charge of production and development, required by important Midlands manufacturer. Actual executive experience of zinc oxide manufacture and full knowledge of latest technical processes and applications essential. This is an important post carrying unusually attractive prospects, exceptional remuneration, and later a seat on the Board for the right man. Box No. 281, Institute of Metals, 4 Grosvenor Gardens, London, S.W.1.

THE INSTITUTE OF METALS

President :

Sir ARTHUR SMOUT, J.P.

Secretary :

Lieut.-Colonel S. C. GUILLAN, T.D.

Editor :

N. B. VAUGHAN, M.Sc., F.I.M.

Assistant Secretary :

Major R. E. MOORE

Administrative and Editorial Offices :

4 GROSVENOR GARDENS, LONDON, S.W.1

Telephone :

SLOANE 6233

INSTITUTE NEWS AND ANNOUNCEMENTS

HONORARY MEMBER OF COUNCIL

Captain (E.) J. E. Cooke, R.N., has been appointed by the Lords Commissioners of the Admiralty to be their representative as an Honorary Member of Council of the Institute in succession to Captain (E.) F. A. Lister, R.N.

AUTUMN MEETING IN PARIS

The 41st Annual Autumn Meeting of the Institute was held in Paris on 3-8 October, when a full programme of meetings and visits was successfully carried through. The meeting, which was attended by over 300 people, has been well reported in the technical press and it is not proposed to give a detailed account here. Full reports of the discussions, with authors' replies, will be published in a special number of the *Journal*.

Speeches at Banquet

All members taking part in the Paris meeting were invited on 4 October to a banquet at the Cercle Interallié, given by the Société Française de Métallurgie and the French Non-Ferrous Metallurgical Industries. Members of the Institute were welcomed in a speech by M. le Général NICOLAU, President of the Société and Chairman of the Paris Meeting Reception Committee. He said :

"The Société Française de Métallurgie has only just celebrated its sixth anniversary, but in spite of the difficulties of the early years the Société has grown rapidly, thanks to the work of the distinguished Presidents who have preceded me. I think one may say that it has now attained the age of discretion. This year it has chosen its President from the Army, no doubt in order to be able to say that it has done its military service, that it has come of age, and that it is taking its place in the world.

"As in the fairy stories which enchanted our childhood, the Princess has this evening donned her first ball dress to do honour to the two good fairies who attended at her birth: the Institute of Metals and the Iron and Steel Institute. The Representative of the Government presides over the feast.

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"In the name of the Société Française de Métallurgie and in that of its numerous members, I have on this memorable evening the agreeable duty of welcoming its guests.

"First of all I would like to express our grateful appreciation to His Excellency Sir Oliver Harvey, the British Ambassador, who has done us the honour of sending as his representative Mr. A. H. Waterfield, his Scientific Attaché; and to Mr. Westman, the Swedish Ambassador, who has so kindly asked Mr. Lundberg, the Cultural Attaché, to show by his presence that he feels with us that the name of Osmond forms a new tie between his country and France.

"Besides these distinguished delegates of the two great nations to whom our Autumn 1949 Meeting is paying honour, the Académie des Sciences is officially represented by our eminent colleagues Albert Caquot, Pierre Chevenard, Poiviliers, and Albert Portevin. Their presence, at a time when the drought of the world overwhelms us, spreads as it were around our table a green oasis in which you will agree with me in seeing a symbol of the humanizing influence of science.

"With this appreciation, which in the names of its representatives I render to French Science, I should like to associate the names of our eminent Honorary Members from abroad: Professor Carl Benedicks, Member of the Royal Academy of Sweden, Dr. C. H. Desch, Past-President of the Iron and Steel Institute and of the Institute of Metals, Dr. M. Roš, President of the Federal Laboratory at Zürich, and of all the men of learning, faithful supporters of the Institute of Metals and of our own Société, who have come in a private capacity from eight countries, some of them distant ones, to work with us and to sit around our family table.

"I may say I have paid dearly, Sir Arthur, for the right to offer my hand to the great Institute which you represent, without there being any doubt as to the sincerity of my friendly feelings for the heroic country whose message of comradeship you bear. Because of these feelings I like to think, despite the official aspect of this banquet, that the Institute of Metals is not paying a visit to France and to the Société Française de Métallurgie, but rather that she is visiting her neighbours, with all the charming associations of mutual friendship, intimacy, and spontaneity that the French word *voisiner* conveys. You must provide me with an English translation, for one day we shall come to pay a neighbourly visit to you in London and to pursue with you, in the atmosphere of friendly esteem which makes for its success, that international collaboration in metallurgy, the vital necessity of which Dr. Seligman preached (it may be truly said, to those already converted) in his authoritative address yesterday. So will France have accomplished, once more acting with your country, that mission which we both pursue, of uniting men in the attainment of that which is highest in them.

"It is with the certainty that you, Mr. Headlam-Morley, who with our great friend Dr. Desch, are here representing the Iron and Steel Institute, have it also at heart to bring together in the realization of the same ideal those in Great Britain who are concerned with iron and steel, that I ask you to convey to the President and members of your Institute, as I have asked Sir Arthur Smout to do for the Institute of Metals, the high esteem and affectionate regard that, in the name of the metallurgists of France, I have

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been entrusted with the moving task of conveying to all the metallurgists of your country."

General Nicolau concluded by paying a graceful tribute to the ladies present.

Sir ARTHUR SMOUT, J.P., President of the Institute of Metals, in his reply, said :

" In the first place may I say, very sincerely, thank you, my dear General, for your kind reception and personal greeting.

" We have all been very much impressed by the warmth of the welcome we have received at the hands of you, our hosts, during the past few days. Everything seems to have conspired to make our visit happy and memorable ; your kindness, your generous hospitality, and your obvious desire to make us welcome and feel at home among you. Added to this we have a high level of the papers for discussion, the opportunity to see much of your lovely City and its delightful environment, and the chance to see some of the industrial establishments in which we are interested. On top of it all, to give us a fuller measure of enjoyment, comes the Clerk of the Weather to provide us with a week of delightful sunshine to enable us to see Paris at her best in all her autumn glory ; yes, Paris of Autumn 1949 will linger long in our memories.

" We hope when the Société Française de Métallurgie comes to London, as come she must in the near future, we can be given an opportunity to return your hospitality in some measure. We have much of interest to show you and, believe me, England is not quite such an austere place as some would make her out to be.

" Progress in all branches of learning is largely dependent on the full interchange of knowledge among workers pursuing similar lines of study, and that is why bodies like the Société Française de Métallurgie and our own Institute of Metals were brought into being, and why we hold these meetings, the social side of which is of great importance, for it is here that friendships are made and acquaintances renewed. Based on such friendships, further exchange of knowledge and goodwill continues long after the formal business has been completed, and so the barriers and distinctions of race, colour, class, creed, and country are broken down and the world becomes a happier place and man a fuller being. My friend Dr. Richard Seligman, a Past-President of the Institute, in his address to you, to which we listened with so much pleasure, spoke yesterday morning of this international aspect of our work and of the urgent need for international collaboration.

" All thinking men are agreed that the world's stock of scientific and practical knowledge is civilization's greatest asset, but there is a large gap between what could be done with such knowledge, and what is in fact being done for the enrichment of mankind and for the attainment of that fuller life to which we strive. This being so, the importance of the note struck by Dr. Seligman and of his appeal for international co-operation becomes increasingly borne in upon us. I would not attempt, this evening, to add anything to what Dr. Seligman said yesterday, but I would assure both him and the Société Française de Métallurgie that any concrete action which may result from the consideration of his appeal will receive the full backing and blessing of the Institute of Metals.

" You, my dear General, used in your speech of welcome that beautiful word *voisin*—a word so pregnant with meaning, of which

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we English in our translation as 'neighbour' lose so much. Encouraged by this association of ideas, I would ask our French friends to regard this visit of the Institute of Metals to Paris as a symbol of friendship, a token of neighbourliness, a tribute, small though it may be, to the spirit of France which has recovered so remarkably and relatively so quickly, since the days of liberation.

"What a contrast between the France of to-day and the France of those days when I recall there was not a single railway bridge intact from Calais to Marseilles. What a grand recovery! The real progress of a country must come from within—the worth of a country is the collective worth of its citizens. France is a great country because her people are great, and Britain is proud to hold out her hand in friendship."

"Some of us came to France wondering how we should find things here. We have found that Paris is still that great centre of learning and City of elegance and loveliness she always was. She has changed—so have we all—but she is, once more, her old self again."

"Mr. President, I thank you again most cordially on behalf of the members of the Institute of Metals for the warm welcome we have received here, and for your generous hospitality."

INSTITUTE OF METALS (PLATINUM) MEDAL FOR 1950

During the course of the Autumn Meeting in Paris, the President (Sir Arthur Smout) announced that the Institute of Metals Medal (in platinum) for 1950 had been awarded to Professor ALBERT M. PORTEVIN, Honorary Member of the Institute, for his outstanding contributions to non-ferrous metallurgy. The award will be made at the Annual General Meeting of the Institute to be held in London on 29–31 March 1950. An account of Professor Portevin's achievements and career appeared in the August 1949 issue of the *Journal* (pp. 197–199).

AUTHORS' REPRINTS OF PAPERS

All authors of papers published in the *Journal* are provided by the Council with a certain number of free reprints, and authors and the bodies sponsoring their work are allowed to purchase any reasonable number of extra reprints. In future, however, all authors will be asked at the time of passing the final proofs to state the total number of reprints required. This step is being taken to assist the printer by allowing him to break up the type immediately each issue of the *Journal* has been printed.

SEPARATE COPIES OF PAPERS

As a special service to Institute Members only, separate copies of all papers published in the *Journal* will in future be supplied at a cost of 25s. per annum, post free. Sets of papers will be obtainable only by annual subscription and will be despatched monthly. The service begins with the papers published in the September 1949 issue of the *Journal*, which contained the first of the papers likely to be discussed at the next Annual General Meeting.

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The service will be a convenience to those members who wish to avoid taking a number of different issues of the *Journal* to meetings, and also to Librarians who are members. One set of papers only will be supplied to each member. Subscriptions should be sent at once to the Secretary.

ELECTION OF ORDINARY MEMBERS AND STUDENT MEMBERS

The following 25 Ordinary Members and 5 Student Members were elected on 21 October 1949.

Ordinary Members

- AYALA, Urbano Lopez, Metallurgical Engineer, The Teziutlan Copper Company, Aire Libre Pue, Mexico.
- BAILEY, William, Chief Layout Draughtsman, Davy and United Engineering Company, Ltd., Park Iron Works, Sheffield.
- BUTLER, Edmund Marshall, Director and Assistant Manager, Kirkstall Forge, Ltd., Leeds 5.
- CLOGENSON, Georges Henry Jean, Dipl.-Ing., Joint General Manager, E. and E. Kaye, Ltd., Queensway, Ponders End, Enfield, Middlesex.
- DAVIES, George, Joint General Manager, E. and E. Kaye, Ltd., Queensway, Ponders End, Enfield, Middlesex.
- DAVIES, Roy Bartlett, B.Sc., Scientific Officer, Metallurgical Section, Research Department, British Insulated Callender's Cables, Ltd., 38 Wood Lane, London, W.12.
- FÉRON, André, Administrateur Directeur, S.A. Visseries et Tréfileries Réunies, Machelen, Belgium.
- FINCH, Donald I., B.S., Chief, Research Department, Metallurgical Division, Leeds and Northrup Company, 4901 Stenton Avenue, Philadelphia 44, Pa., U.S.A.
- FRANKLIN, William Walter, Chief Engineer, Davy and United Engineering Company, Ltd., Park Iron Works, Sheffield.
- GOODLAD, Wilfred Horace, Assistant Chief Engineer, Design and Development, Davy and United Engineering Company, Ltd., Park Iron Works, Sheffield.
- GRIMSTON, The Honourable John, Director and General Manager, Enfield Rolling Mills, Ltd., Millmarsh Lane, Brimsdown, Enfield, Middlesex.
- JOSEPHS, Ellis, Foundry Manager, Leopold Lazarus, Ltd., St. Stephen's Street, Birmingham 6.
- LEWIS, William Edmund Jenkin, B.Sc., Principal Surveyor for Metals, Lloyds Register of Shipping, 71 Fenchurch Street, London, E.C.3.
- MACDONALD, William Richardson Dickson, Director and Manager, The Yorkshire Copper Works, Ltd., Leeds.
- MILKO, John A., B.S., Research Engineer, Battelle Memorial Institute, 505 King Avenue, Columbus, O., U.S.A.
- MORTON, James Storrs, D.F.C., M.A., Assistant Manager, Telcon Metals, Telegraph Construction and Maintenance Company, Ltd., Telcon Works, Greenwich, London, S.E.10.
- MUNNIK, Eric Howard, Engineer Technician, Rhodesian Iron and Steel Commission, P.O. Box 44, Que Que, Southern Rhodesia.

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- NEEDLEMAN, Benjamin, B.Sc., Works Metallurgist, Union Steel Corporation of South Africa, Vereeniging, Transvaal, South Africa.
- PADLEY-SMITH, Arthur Edwin, General Manager, Aerlec (Aluminium), Ltd., Stoke Prior, Bromsgrove, Worcestershire.
- PLACE, Arthur, Rolling Mill Manager, Claywheel Rolling Mills, Claywheel Lane, Sheffield 6.
- ROGERS, Thomas Howard, D.I.C., Corrosion Investigator, Royal Naval Establishment, Halifax, Nova Scotia, Canada.
- SCHRAMM, Jacob, Dr.-Ing., Chief Metallurgist, Metall-Guss- und Presswerk Heinrich Diehl, Nuremberg, Germany.
- TIMMIS, Laurence Barnett, M.Sc., Librarian, Armament Research Establishment, Ministry of Supply, Fort Halstead, Sevenoaks, Kent.
- VAN LANCKER, Marc, Ing. Chim., Consultant Metallurgist, 40 Avenues des Colonies, Anvers, Belgium.
- WAKELING, Albert Lorraine, Metallurgist, J. Stone and Company, Ltd., Charlton, London, S.E.7.

Student Members

- BHAT, Uppinangady Gopalkrishna, B.Sc., Apprentice Metallurgist, Indian Smelting and Refining Company, Ltd., Bhandup, Bombay, India.
- BRADLEY, Donald, Scientific Assistant, Royal Aircraft Establishment, Farnborough, Hampshire.
- ELLIOTT, Sam John Lloyd, B.Met.E., Metallurgical Engineer, c/o Commonwealth Bank of Australia, Australia House, Strand, London, W.C.2.
- FRANSES, Claude, Engineer, Société Schneider, 15 rue Pasquier, Paris, France.
- WATERS, Brian Harry Coles, B.A., Research Metallurgist, Metallurgy Department, The University, Pembroke Street, Cambridge.

The following 11 Ordinary Members and 7 Student Members were elected on 8 November 1949 :

Ordinary Members

- ASTON, Charles Frederick, General Manager, Heaton and Dugard, Ltd., Shadwell Street Mills, Birmingham 4.
- BAILEY, Harold John, Sales Manager, Evered and Company, Ltd., Surrey Works, Smethwick, Staffs.
- BANNISTER, William Joseph, B.Sc., Divisional Manager, Wire Mills Production Division, British Insulated Callender's Cables, Ltd., Prescott, Lancashire.
- BOTHAM, George Henry, B.Sc., Laboratory Manager, A.P.V. Company, Ltd., Wandsworth Park, London, S.W.18.
- HÄGG, Gunnar, Ph.D., Professor of General and Inorganic Chemistry, University of Uppsala, Uppsala, Sweden.
- MARÉCHAL, Jean, Ing. civil des Mines, Chef du Service des Recherches et des Laboratoires de l'Usine de Dives, Compagnie du Duralumin et du Cuivre, Dives-sur-Mer, Calvados, France.
- MEREDITH, George, General Sales Manager, James Booth and Company, Ltd., Argyle Street Works, Nechells, Birmingham 7.

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- ROCA SOLER, José, General Manager, Cia. Roca-Radiadores, S.A., Gavá, Spain.
- SMITH, James Arthur, B.Met., Metallurgist, The English Electric Company, Ltd., Research Department (Metallurgy Section), Stafford.
- TAYLOR, Henry George, D.Sc., Director of Research, British Welding Research Association, 29 Park Crescent, London, W.1.
- TAYLOR, Robert Clive, Chief Chemist and Metallurgist, T. J. Priestman, Ltd., Cupro Foundry, Leopold Street, Birmingham 12.

Student Members

- CUPP, Calvin Robert, Student of Metallurgy, The University, Toronto, Canada.
- EL-MEHAIRY, Ahmed Ezzat, B.Sc., Metallurgical Research Student, Sir John Cass Technical Institute, Jewry Street, Aldgate, London, E.C.3.
- GREENFIELD, Peter, B.Sc., Student of Metallurgy, The University, Edgbaston, Birmingham.
- JORDAN, Michael Frederic, Student of Metallurgy, The University, Edgbaston, Birmingham.
- MOFFATT, Robert Sydney Martin, B.Sc., Metallurgist, Appleby-Frodingham Steel Company, Ltd., Scunthorpe, Lincolnshire.
- RYDER, Colin David, Student of Metallurgy, The University, Liverpool.
- SHARP, Peter Edward, Technical Assistant, Tungsten Wire Department, British Thomson-Houston Company, Ltd., Rugby, Warwickshire.

PERSONALITIES

Mr. H. G. Dale

Mr. Hugh Gordon Dale, the Chairman of the Sheffield Local Section for the year 1949-50, was born at New Barnet, Herts., in 1885. He was educated at Queen Elizabeth's School, Barnet, being Head of the School in 1902, and at Finsbury Technical College. After being Senior Student there in 1905, Mr. Dale spent a year in research work in the laboratory of Professor R. Mendola, under whom he had studied at Finsbury, before entering the laboratory of Messrs. F. Claudet, assayers to the Bank of England. He remained there until 1919, when he joined the staff of the Sheffield Smelting Company, Ltd., precious metal refiners. In 1930 he became Chief Chemist to the Company, a position he still holds.



NEWS AND ANNOUNCEMENTS

Mr. Dale was elected an Associate of the Institute (now Royal Institute) of Chemistry in 1910 and a Fellow in 1913, and he delivered the 1941 Streatfeild Memorial Lecture to that Institute on the subject of "The Precious Metals". He has served on the Committee of the Sheffield Local Section of the Institute of Metals since 1930, and was Vice-Chairman of the Section from 1937 to 1949.

In his younger days Mr. Dale was a keen cricketer and footballer and played for Barnet and Hallam (Sheffield). In 1913 he married Miss Dorothy Pavitt and has one son and one daughter.

By virtue of his Chairmanship of the Sheffield Local Section, Mr. Dale is now a Member of Council of the Institute.

PERSONAL NOTES

MR. P. T. ARTHUR has left the Royal Technical College, Glasgow, to join the staff of the Research Department of Messrs. Hadfields, Ltd., Sheffield.

PROFESSOR CARL BENEDICKS (Honorary Corresponding Member to the Council for Sweden) was presented with the first Osmond Medal of the Société Française de Métallurgie during the Osmond Centenary Ceremony held in Paris on 7 October.

MR. D. R. G. DAVIES has returned from America and has taken up his duties as Chief Metallurgist at the Redbourn Branch of Richard Thomas and Baldwins, Ltd., Scunthorpe, Lincs.

MR. H. S. GUPTA has been appointed Assistant Professor of Metallurgy at the Government Engineering College of Central Provinces and Berar, Jubbelpore. He will begin his duties in the session of 1950-51.

MR. R. S. JACKSON has been appointed assistant metallurgist with David Brown Foundries, Penistone, Yorks.

MR. A. J. KILLINGTON, having been awarded the degree of B.Sc. (Eng.) of London University and the Diploma of Associateship of the Royal School of Mines, both with 2nd Class Honours, has taken up an appointment in the Research Laboratories of Goodlass Wall and Lead Industries Ltd., Greenford, Middlesex.

MR. W. R. P. KING, Works Manager of The Mint, Birmingham, Ltd., has been elected a Fellow of the Institution of Works Managers. He has also been re-elected Chairman of the West Midland Branch of the I.W.M. for the 1949-50 season.

MR. D. V. MECHEM is now a metallurgist in the Research Department of the National Smelting Co., Ltd., Avonmouth.

MR. D. S. OLIVER has taken up a research studentship in the H. H. Wills Physical Laboratory at the University of Bristol.

MR. H. W. PAXTON has left this country to take up a Post-Graduate Scholarship in Technology tenable at Purdue University, Lafayette, Ind., U.S.A.

MR. J. J. PICK has been awarded the degree of B.Eng. (2nd Class Honours) of Liverpool University and has been appointed a research investigator in the laboratories of Goodlass Wall and Lead Industries, Ltd., Greenford, Middlesex.

MR. L. D. ROBLIN has been appointed to the foundry metallurgical staff of the South Wales Aluminium Co., Ltd., Resolven, Neath, Glam.

DR. RICHARD SELIGMAN (a Past-President of the Institute) delivered a lecture to the Société Française de Métallurgie on 3 October, his subject being "An International Metallurgical Association".

DR. R. SKORSKI has been awarded the degree of Doctor of Science at the Mining Academy, Cracow, and is now Head of the Physical Examination of Metals Division, at the Institute of Metal Treatment and Working, Warsaw.

DR. I. G. SLATER has resigned his position as Director of Operational Research, Admiralty, and has joined Tube Investments, Ltd., as Director of Research and Development of its Aluminium Division. He will be attached to the administrative and marketing organization of T.I. Aluminium, Ltd., and will also be connected with the research and development of the concern's subsidiaries, Reynolds Rolling Mills, Ltd., Reynolds Light Alloys, Ltd., and the South Wales Aluminium Co., Ltd.

SIR ARTHUR SMOUT (President) has been appointed Chairman of the Regional Academic Board of the West Midlands Advisory Council for Technical, Commercial, and Art Education, in succession to Sir Hugh Chance.

MR. ROY IRWIN SWIFT, formerly on the faculty of the School of Metallurgical and Chemical Engineering of Purdue University, has been awarded the degree of Doctor of Engineering by Yale University. He has joined the faculty of the Mackay School of Mines of the University of Nevada at Reno to teach mining and metallurgy.

NEWS OF LOCAL SECTIONS

SOUTH WALES LOCAL SECTION

Fire-Refining and Casting of Copper

At a meeting of the Section held at University College, Swansea, on 11 October, Mr. Harry Davies, F.I.M., gave a lecture on "Fire-Refining and Casting of Copper", in which he dealt with some developments of the present century.

Mr. Davies first reviewed the history of the establishment of copper smelting in South Wales, its rise and decline. The original fire-refining reverberatory method was discussed and also present practice, with reference to the chemical and metallurgical reactions. The set surface or "pitch" was explained on the basis of Dr. N. P. Allen's work.

A rotary furnace for fire-refining and a large reverberatory furnace for the mass production of wire-bars, using a Walker casting machine, were described.

Finally, an account was given of the melting of cathode copper in a direct-arc furnace and the subsequent casting in water-cooled moulds, as carried out at the International Nickel Company's plant at Copper Cliff, Ont.

The lecture was illustrated by samples and lantern slides.

OTHER NEWS

CHANGES IN NAMES OF ELEMENTS

At a meeting of the International Union of Chemistry held in Amsterdam early in September, changes in the official names of several elements used in alloys were agreed upon by scientists representing 30 nations. The most important change is that by which tungsten will in future be known as wolfram. In all, decisions were reached on the names of 14 elements, and further changes may be made when the Union meets again in two years' time. The full list of decisions is as follows:

<i>Atomic No.</i>	<i>Approved Name.</i>
4	Beryllium (not glucinum)
41	Niobium (not columbium)
43	Technetium (for masurium)
61	Promethium (for illinium)
71	Lutetium (for lutecium)
72	Hafnium
74	Wolfram (for tungsten)
85	Astatine
87	Francium (for alabamine)
91	Protactinium (for protoactinium)

In addition, four names used for new elements resulting from atomic research have been adopted:

93	Neptunium
94	Plutonium
95	Americium
96	Cirium

BRITISH INDUSTRIES FAIR

The annual British Industries Fair will be held in London (Earls Court and Olympia) and Birmingham (Castle Bromwich) on 8-19 May, 1950, and will as usual be organized by the Board of Trade in collaboration with the Birmingham Chamber of Commerce.

LIÈGE INTERNATIONAL FAIR

The Liège International Fair will take place on 29 April-14 May 1950. The Fair will be concerned with mining, metallurgy, mechanical engineering, and electricity in industry, and to emphasize the technical as well as the commercial aspects of the Fair, a series of lectures on these subjects will be given. Fuller information may be obtained from the offices of the Fair, 32 Boulevard de la Sauvenière, Liège, Belgium.

A.S.T.M. MEETINGS

The American Society for Testing Materials will hold its Committee Week and Spring Meeting at the Hotel William Penn, Pittsburgh, Pa., from 27 February to 3 March 1950. The 53rd Annual Meeting, together with the Ninth Exhibit of Testing Apparatus and Related Equipment, will take place at the Chalfonte-Haddon Hall, Atlantic City, N.J., on 26-30 June 1950.

NEWS AND ANNOUNCEMENTS

MISSOURI SCHOOL OF MINES AND METALLURGY

A National Lead Fellowship in metallurgy has been established at the Missouri School of Mines and Metallurgy at Rolla, Mo., by the Titanium Alloy Manufacturing Division of the National Lead Company of Niagara Falls, N.Y. Holders of the fellowship may become candidates for the degree of Doctor of Philosophy.

A stipend of \$1500 a year for a two-year period is provided, and, if the holder is a veteran, the stipend may supplement G.I. educational allowance. It will be available for the semester beginning 30 January 1950.

According to officials of the Company, it is hoped that the student accepting the assistance plan will select some phase of titanium metallurgy for research.

The Ludlow-Saylor Wire Company of St. Louis has announced that it will again sponsor a fellowship at Missouri School of Mines and Metallurgy to encourage the study of problems related to the manufacture of wire cloth. The fellowship, which carries an annual stipend of \$1500, will be available at the beginning of the second semester, 30 January 1950, and is open to individuals qualified to carry on graduate work in metallurgy.

Further information on both the above fellowships may be obtained from Dr. A. W. Schlechten, Chairman, Department of Metallurgical Engineering, Missouri School of Mines and Metallurgy, Rolla, Mo., U.S.A.

THE ROYAL COMMISSION ON AWARDS TO INVENTORS

It has been decided by the Treasury, with the concurrence of the Royal Commission on Awards to Inventors, that a time limit should be set within which claims regarding the use of inventions, designs, drawings, and processes should be lodged with the Government Department concerned if they are to be dealt with by the Royal Commission. It is felt that, in the interest both of the claimant and the Treasury, claims should be disposed of while the necessary evidence is available. The Treasury have accordingly announced that claims under Heads 1, 3, and 4 of the Royal Commission's terms of reference must be submitted to the Government Department concerned on or before 31 December 1949.

A general survey of the principles adopted by the Commission is contained in the First Report which is obtainable from H.M. Stationery Office, York House, Kingsway, W.C.2, price 6d., or by post 7d., or through any bookseller.

The majority of claims dealt with by the Commission or the Investigating Committee, which consists of members of the Commission, have been ex-gratia claims falling within Head 3.

A shortened form of procedure for lodging claims has been drawn up which will enable claims to be dealt with more expeditiously.

Claims for alleged use by the Navy should be sent to the Director of Navy Contracts, Patents Division, Foxhill, Bath, and those relating to the Army or Royal Air Force, to the Ministry of Supply, Patents Division, Melbourne House, Aldwych, W.C.2.

NEWS AND ANNOUNCEMENTS

DIARY FOR DECEMBER

LOCAL SECTIONS MEETINGS

THURSDAY, 1 DECEMBER

Birmingham Local Section.—Dr. Marie L. V. Gayler: "Age-Hardening". (James Watt Memorial Institute, Great Charles Street, Birmingham, at 6.30 p.m.)

TUESDAY, 6 DECEMBER

South Wales Local Section.—Asst. Professor R. Higgins: "Refractories, with Special Reference to Slag Corrosion". (Metallurgical Department, University College, Singleton Park, Swansea, at 6.30 p.m.)

THURSDAY, 8 DECEMBER

London Local Section.—P. D. Liddiard and P. G. Forrester: "Casting Copper-Lead Bearings". Joint Meeting with the London Branch of the Institute of British Foundrymen. (Waldorf Hotel, Aldwych, London, W.C.2, at 7 p.m.)

MONDAY, 12 DECEMBER

Scottish Local Section.—W. A. Baker introduces a discussion on "The Casting of Non-Ferrous Metals". (39 Elmbank Crescent, Glasgow, C.2, at 6.30 p.m.)

THURSDAY, 15 DECEMBER

Sheffield Local Section.—E. Davis: "Recent Progress in Copper and Copper Alloys". (Grand Hotel, Sheffield, at 6.30 p.m.)

OTHER MEETINGS

THURSDAY, 1 DECEMBER

Leeds Metallurgical Society.—Dr. A. J. Gould: "Corrosion Fatigue". (Chemistry Department. The University, Leeds 2, at 7 p.m.)

Liverpool Metallurgical Society.—Dr. C. H. Desch: "The Cold Working of Metals". (Liverpool Engineering Society's Rooms, 9 The Temple, 24 Dale Street, at 7 p.m.)

TUESDAY, 6 DECEMBER

Institute of Physics, Scottish Branch.—Professor N. F. Mott: "The Physical Explanation of the Strength of Metals". (University of Glasgow, at 7 p.m.)

Society of Chemical Industry, Chemical Engineering Group.—Dr. W. H. J. Vernon and Dr. K. R. Butlin: "Underground Corrosion of Ferrous Metals: Causes and Prevention". (Geological Society, Burlington House, Piccadilly, W.1, at 5.30 p.m.)

NEWS AND ANNOUNCEMENTS

WEDNESDAY, 7 DECEMBER

Institution of Production Engineers, Wolverhampton Section.—G. R. Shotton: "Foundry Technique in Relation to Engineering Production". (Dudley and Staffordshire Technical College, Dudley, at 7 p.m.)

Manchester Metallurgical Society.—N. Davidson: "Design of Wire-Drawing and Other Cold-Working Machines". (Engineers' Club, Albert Square, Manchester, at 6.30 p.m.)

THURSDAY, 8 DECEMBER

Institute of Physics, London and Home Counties Branch.—Dr. F. P. Bowden: "Some Physical and Chemical Effects of Friction". (47 Belgrave Square, S.W.1, at 5.30 p.m.)

Royal Aeronautical Society, Graduate and Student Section.—C. J. Moss: "Bonding of Aircraft Materials with Synthetic Adhesives". (4 Hamilton Place, W.1, at 7.30 p.m.)

FRIDAY, 9 DECEMBER

Institution of Production Engineers, Coventry Section.—Dr. J. D. Jevons: "Defects and Developments in Deep Drawing and Pressing". (Greyfriars Rooms, The Geisha Café, Hertford Street, Coventry, at 7 p.m.)

SATURDAY, 10 DECEMBER

Swansea and District Metallurgical Society.—Professor H. W. Swift: "The Deep Drawing of Metals". (Central Library, Swansea, at 6.30 p.m.)

TUESDAY, 13 DECEMBER

Institution of Production Engineers, Wolverhampton Graduate Section.—R. Hanes: "An Engineer's Survey of the Impact Extrusion Process". (County Technical College, Wednesbury, at 7.15 p.m.)

WEDNESDAY, 14 DECEMBER

Institute of Welding, West of Scotland Branch.—J. McDonald: "Radiography, with Special Reference to the Interpretation of Radiographs". (39 Elmbank Crescent, Glasgow, C.2, at 7 p.m.)

Institution of Structural Engineers, Lancashire and Cheshire Branch.—Films: "Aluminium—Mine to Metal" and "How to Weld Aluminium". (Reynolds Hall, College of Technology, Manchester, at 7 p.m.)

THURSDAY, 15 DECEMBER

Institution of Mining and Metallurgy.—F. G. Hill: "Management in Industry". (Geological Society, Burlington House, Piccadilly, W.1, at 5 p.m.)

Institution of Production Engineers, Glasgow Section.—C. J. A. Taylor: "Modern Surface Coatings". (39 Elmbank Crescent, Glasgow, C.2, at 7.30 p.m.)

Institution of Production Engineers, Manchester Graduate Section.—F. Koenigsberger: "Design for Welding". (Reynolds Hall, College of Technology, Manchester, at 7.15 p.m.)

NEWS AND ANNOUNCEMENTS

FRIDAY, 16 DECEMBER

Institution of Production Engineers, Eastern Counties Section.—Dr. A. R. E. Singer: "Metallurgy and Its Importance to Production Engineering". (Lecture Hall, Electric House, Ipswich, at 7.30 p.m.)

MONDAY, 19 DECEMBER

Institution of Production Engineers, Derby Sub-Section.—W. J. G. Cosgrave: "Induction Heating". (School of Art, Green Lane, Derby, at 7 p.m.)

TUESDAY, 20 DECEMBER

Institution of Production Engineers, Luton, Bedford, and District Section.—J. A. Grainger: "Sheet Metal as a Substitute for Other Material". (Small Assembly Room, Town Hall, Luton, at 7 p.m.)

APPOINTMENTS VACANT

To conform to the requirements of the Control of Engagements Order, 1947, these advertisements are published for the information only of those who are "excepted persons" under the Order.

BATTERSEA POLYTECHNIC, LONDON, S.W.11. APPOINTMENT OF HEAD OF METALLURGY DEPARTMENT. The Governing Body invite applications from well-qualified Metallurgists for the above-mentioned post. Salary in accordance with the scale £800 × £25—£950 per annum plus London, Graduate, and Training Allowances. Further particulars may be obtained from the Clerk to the Governing Body, by whom applications must be received not later than 7 December 1949.

CHEMIST wanted for control of Process Laboratory of Midland Company. Sound knowledge of analysis of metals, including tungsten, is necessary. Applicants must be able to control staff and organize work. Age 23–30. Salary in accordance with age and experience. Box No. 284, Institute of Metals, 4 Grosvenor Gardens, London, S.W.1.

COVENTRY ENGINEERING COMPANY have vacancy for Assistant Metallurgist, age 22–30. Applicant should hold the degree of B.Sc. or A.I.M., and have sound basic knowledge of ferrous and non-ferrous metallurgy. Some knowledge of powder metallurgy an advantage. The post is progressive. Salary commensurate with experience. Pension scheme. Box No. 282, Institute of Metals, 4 Grosvenor Gardens, London, S.W.1.

FOUNDRY SECTION of The A.P.V. Company, Ltd., Wandsworth Park, London, S.W.18, require **DEPUTY MANAGER**. Duties include sales and technical management of foundries making aluminium, bronze, and stainless steel castings; also supervising general engineering sales. Applicant should preferably be in the thirties and have metallurgical training and some practical foundry experience with engineering background. He must be a good administrator and be sales-minded. Plans for expansion provide excellent opportunities. Apply in writing stating experience, age, education, and salary required.

METALLURGIST, 40–45 years, Public School and University education, good qualifications, required for Senior Position of Technical Director by old-established Private Company, Non-Ferrous Metal Manufacturers. Write, giving full details, to Box No. 283, Institute of Metals, 4 Grosvenor Gardens, London, S.W.1.

WORKS MANAGER'S DEPUTY required for Non-ferrous Smelting and Refining Works in London area. Should have sound technical education of degree standard, preferably in metallurgy or chemistry, and at least five years' industrial experience in position of responsibility. Interest in costs and non-technical aspects of works management desirable, also knowledge of technology of lead, tin, and antimony. Salary, according to qualifications and experience, in the range £700–£850 per annum. Full particulars to Box No. 285, Institute of Metals, 4 Grosvenor Gardens, London, S.W.1.

BULLETIN ANALYTIQUE

Publication of the Centre National de la Recherche Scientifique, France

The *Bulletin Analytique* is an abstracting journal which appears monthly in two parts, Part I covering scientific and technical papers in the mathematical and physical sciences and their applications, Part II the biological sciences.

The *Bulletin*, which started on a modest scale in 1940, with an average of 10,000 abstracts per part, now averages 35,000 to 45,000 abstracts per part. The abstracts summarize briefly papers in scientific and technical periodicals received in Paris from all over the world, and cover the majority of the more important journals in the world scientific press. The scope of the *Bulletin* is constantly being enlarged to include a wider selection of periodicals.

The *Bulletin* thus provides a valuable reference book both for the laboratory and for the individual research worker who wishes to keep in touch with advances in subjects bordering on his own.

A specially interesting feature of the *Bulletin* is the microfilm service. A microfilm is made of each article as it is abstracted, and negative microfilm copies or prints from microfilm can be purchased from the editors.

The subscription rates for Great Britain are 4000 frs. (£5) per annum for each part. Subscriptions can also be taken out to individual sections of the *Bulletin* as follows:

	<i>frs.</i>	<i>£ s. d.</i>
Pure and Applied Mathematics—Mathematics— Mechanics	550	14 6
Astronomy—Astrophysics—Geophysics	700	18 0
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Subscriptions can be paid directly to the editors: Centre National de la Recherche Scientifique, 18 rue Pierre-Curie, Paris 5ème. (Compte-chèque-postal 2500-42, Paris), or through Messrs. H. K. Lewis & Co., Ltd., 136 Gower St., London, W.C.1.

THE STRUCTURE OF METALS AND ALLOYS

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INSTITUTE NEWS AND ANNOUNCEMENTS

INSTITUTE MEETINGS IN 1950

THE 42ND ANNUAL GENERAL MEETING of the Institute will take place in the Hall of the Institution of Mechanical Engineers, Storey's Gate, London, S.W.1, on Wednesday, 29 March, and Thursday, 30 March, 1950. It is possible there will also be a further session for the discussion of papers on the morning of Friday, 31 March. This would take place at 4 Grosvenor Gardens, S.W.1, and *not* at the Institution of Mechanical Engineers.

On the first morning the new President of the Institute, Mr. H. S. TASKER, Chairman of Goodlass Wall and Lead Industries, Ltd., will be inducted into the Chair and will deliver his Presidential Address.

During the course of the meeting the Institute of Metals Medal in Platinum will be presented to Professor Albert Portevin, who has expressed his intention of being present.

THE 40TH MAY LECTURE will be delivered at the Royal Institution, Albemarle Street, London, W.1, on Wednesday, 10 May, 1950, at 6 p.m. As already announced, the lecturer will be Dr. H. Roxbee Cox, Director of the National Gas Turbine Establishment.

THE 42ND ANNUAL AUTUMN MEETING will be held in Bournemouth from Tuesday, 19 September, to Friday, 22 September 1950.

DISCUSSION OF PAPERS

In order to assist the Committee responsible for arranging the programme of the next General Meeting of the Institute, will all members who are prepared to discuss orally any of the papers published in the September-December 1949 issues of the *Journal*, please inform the Secretary as soon as possible.

It is hoped that such information will enable a programme to be arranged which will secure well attended and lively discussions.

NEWS AND ANNOUNCEMENTS

INSTITUTE'S TELEPHONE

A new G.P.O. switchboard has recently been installed at 4 Grosvenor Gardens, and the Institute has now got an additional G.P.O. line, which should greatly facilitate telephone communication. Will members please note the telephone numbers of the Institute and of allied organizations at this address, as follows :

Institute of Metals	{	SLOane	5928
		„	6233
Iron and Steel Institute	{		
Joint Library			
Joint Committee on National Certificates in Metallurgy		SLOane	0061
		„	0062
Joint Committee on Metallurgical Education		„	0063
Mond Nickel Fellowships Committee	{		
Institution of Metallurgists		SLOane	1172

Institute's Telephone Extensions

Members not having need to speak to the Secretary personally are requested to note the following main G.P.O. telephone extensions :

	<i>Extension :</i>
Private Secretary to the Secretary	28
Major R. E. Moore, Assistant Secretary : General Administration	29
Mr. N. B. Vaughan, Editor	25
Editorial Department	26
Publication Sales and Accounts	24
Members' Subscriptions	24

ELECTION OF ORDINARY MEMBERS AND STUDENT MEMBERS

The following 21 Ordinary Members and 26 Student Members were elected on 9 December 1949 :

Ordinary Members

- BELL, Raymond Charles, B.A., B.A.Sc., Research Engineer, Consolidated Mining and Smelting Company of Canada, Ltd.
- CATLING, Jack Harold, Joint Managing Director, Reynolds Light Alloys, Ltd., Redfern Road, Tyseley, Birmingham 11.
- CUTLER, Percy, Assistant Works Manager, Government of India (Ministry of Defence) Ordnance Factory, Ambarnath, near Bombay, India.
- DICKENS, Arthur, Engineering Trades Sales Manager, Imperial Chemical Industries, Ltd., National Provincial Bank Buildings, Bute Street, Cardiff.
- DUTTA, Sudhendu Kumar, M.Sc., Assistant Foreman, Metallurgical Laboratory, Inspectorate of Metal and Steel, Ishapore, West Bengal, India.
- ELLIOTT, Eric, A.Met., Liaison Officer, Aluminium Development Association, 33 Grosvenor Street, London, W.1.
- JACKSON, Horace Ernest, Delegate Director, Imperial Chemical Industries, Ltd., Metals Division, Witton, Birmingham 6.

NEWS AND ANNOUNCEMENTS

- MORRISON, Professor John Lamb Murray, D.Sc., Professor of Mechanical Engineering, University of Bristol, Engineering Laboratories, Unity Street, Bristol 1.
- NEWTON, James Welsby, B.Sc. (Eng.), Engineering Manager, Staffordshire Factories of Thomas Bolton and Sons, Ltd., Froghall, Stoke-on-Trent, Staffs.
- PAISH, Ralph, Assistant Metallurgist, Rotol, Ltd., Gloucester.
- PRIMUS, Professor Francis Charles, Professor of Mechanical Technology, České Vysoké Učení Technické, Karlovo nám 13, Prague, Czecho-Slovakia.
- RICKSECKER, Ralph E., B.S., Chief Metallurgist, Cleveland Division, Chase Brass and Copper Company, Inc., 1121 East 260th Street, Cleveland, O., U.S.A.
- RYBCZYNSKI, Ludwik, Student of Engineering, Metallographic Laboratory, Zakłady Przemysłowe H. Cegielski, Poznań, Poland.
- SERGEANT, William John Clive, Production Control Chemist, Copper and Alloys, Ltd., Greets Green Road, West Bromwich, Staffordshire.
- SHARP, Herbert John, B.Sc., Metallurgist, Hoover, Ltd., Perivale, Greenford, Middlesex.
- SHELVINGTON, William Edwin, Metallurgical Chemist, Copper and Alloys, Ltd., Greets Green Road, West Bromwich, Staffordshire.
- SMITH, Eugene M., B.S., M.S., Development Engineer, Youngstown Sheet and Tube Company, Youngstown, O., U.S.A.
- THOMPSON, Lawrence S., Ph.D., Librarian, University of Kentucky Libraries, Lexington 29, Ky., U.S.A.
- TUCHSCHMID, Eugen Heinrich, Assistant to the Professor of Physical Metallurgy, Eidgenössische Technische Hochschule, Zürich, Switzerland.
- WILLIAMS, Sidney Jonas, Assistant Metallurgist, International Alloys, Ltd., Aylesbury, Buckinghamshire.
- WILSON, Clifford, Ph.D., B.Sc., A.R.S.M., D.I.C., Chief Production Metallurgist, High Duty Alloys, Ltd., Trading Estate, Slough, Bucks.

As Student Members

- ARNOLD, Brian, Student of Metallurgy, Coventry Technical College, Coventry.
- BARTNIK, George, Student of Metallurgy, Battersea Polytechnic, London, S.W.11.
- BELL, Henry B., Student of Metallurgy, Royal Technical College, Glasgow.
- BERRY, Brian Shepherd, B.Sc., Research Student, Department of Metallurgy, University of Manchester.
- BETON, Robin Hartley, Student of Metallurgy, Manchester University.
- CHATTERJEE, Ajit Kumar, B.Sc., Research Student, Manchester University.
- CONGREVE, Walter Kendall, B.A.Sc., Student of Metallurgy, Manchester University.
- GREEN, Terence Edwin, Student of Metallurgy, Manchester University.
- HARRIS, Louis Reuben, B.A., Assistant Research Metallurgist, National Smelting Company, Ltd., Avonmouth, Bristol.

NEWS AND ANNOUNCEMENTS

- HAWKINS, Neville, Student of Metallurgy, Manchester University.
HOUSEMAN, David Henry, B.A., Student of Metallurgy, Cambridge University.
HUGO, Jacques Pierre, B.Sc., Student of Metallurgy, Sheffield University.
JAMIESON, Archibald, Foundry Metallurgist, Argus Foundry, Ltd., Thornliebank, near Glasgow.
KAY, Gerald Harry, Student of Metallurgy, Birmingham University.
KEEN, (Miss) Maureen Sheila Marie, Student of Metallurgy, Manchester University.
KOENIG, Hans M., Student of Engineering, Imperial Chemical Industries, Ltd., Metals Division, Gowerton, Glamorgan.
LAURIENTE, Mike, B.S., M.S., Student of Engineering, Johns Hopkins University, Mechanical Engineering Department, 34th and Charles Avenue, Baltimore 18, Md., U.S.A.
LEA, Albert Dennis, Student of Metallurgy, University of Manchester.
MITCHELL, Gordon H., Student of Metallurgy, Royal Technical College, Glasgow.
NISBETT, Edward George, Student of Metallurgy, Royal Technical College, Glasgow.
POMEROY, Patrick Reginald Dan, Bursar, British Non-Ferrous Metals Research Association, Euston Street, London, N.W.1.
POOLE, David Michael, Student of Metallurgy, Manchester University.
RYDER, Dennis Arthur, Student of Metallurgy, Birmingham Central Technical College.
SCUTTS, William, Foundry Metallurgist, G. and J. Weir, Ltd., Cathcart, Scotland.
SPEIRS, Archibald, Student of Metallurgy, Royal Technical College, Glasgow.
TERRY, Robert Brian, Student of Metallurgy, University of Birmingham.
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PERSONAL NOTES

MR. N. BAILEY is now a metallographer on the staff of High Duty Alloys, Ltd., Slough.

MR. A. G. BRAIN is now with the Bristol Aeroplane Co., Ltd., Filton.

MR. G. B. BROOK (Student Member) has left the British Non-Ferrous Metals Research Association and is now an investigator with the Fulmer Research Institute, Stoke Poges, Bucks.

MR. WYLIE J. CHILDS has been appointed Associate Professor of Metallurgy at Lafayette College, Easton, Pa., and is in charge of the foundry educational programme.

DR. A. H. COTTRELL has been appointed first Professor of Physical Metallurgy in the University of Birmingham.

MR. J. P. DENNISON has received the degree of Ph.D. of Leeds University and has been appointed a lecturer in metallurgy there.

SIR WILLIAM GRIFFITHS has been elected Vice-President of the Copper Development Association.

NEWS AND ANNOUNCEMENTS

MR. M. E. HARGREAVES has now completed his term in England under a C.S.I.R.O. studentship and has returned to Australia to resume his duties as Research Officer in the Division of Tribophysics at Melbourne University.

MR. H. J. KOZLOWSKI is on leave of absence from the Physical Metallurgy Division, Bureau of Mines, Ottawa, while undertaking graduate studies in physical metallurgy at the Hammond Metallurgical Laboratories, School of Engineering, Yale University, New Haven, Conn.

DR. J. V. LYONS has now left the A.D.A. Welding Research Team, which has been working at the University of Birmingham, and has taken up an appointment with T.I. (Group Services), Ltd., Plume Street, Aston, Birmingham 6.

MR. D. J. MANNOX, having obtained 2nd class honours in Part II (Metallurgy) of the Natural Science Tripos at Cambridge, is now a Graduate-Trainee with Murex, Ltd.

MR. R. L. MORTON has recently received the degree of B.Sc. in Applied Chemistry (Metallurgy) of Glasgow University.

PROFESSOR A. J. MURPHY has been appointed Chairman of the Inter-Service Metallurgical Research Council in succession to Professor L. Aitchison, who has resigned owing to illness, though still remaining a member of the Council.

MR. F. R. N. NABARRO is now at the Metallurgy Department of Birmingham University.

MR. V. A. PHILLIPS recently returned from America at the completion of graduate studies in the Department of Metallurgy at Yale University. He is now at the Cavendish Laboratory, Cambridge, working as a Research Student under Dr. E. Orowan of the Metal Physics Section.

MR. R. L. PRAIN has succeeded Mr. S. S. Taylor (now elected Chairman of the Association) as Chairman of the Management Committee of the Copper Development Association.

DR. G. V. RAYNOR has been appointed first Professor of Metal Physics in the University of Birmingham. A full account of his career was published in the news section of the August, 1949, issue of the *Journal* (pp. 199-200).

DR. E. C. ROLLASON has been elected Chairman of the Programme and Journal Committee of the Institute of Welding and has been re-appointed the representative of that Institute on the Joint Committee for Materials and Their Testing.

DR. GEORGE SACHS has resigned from his position as Director, National Metallurgical Laboratory, Jamshedpur, India, and has established offices as Consulting Engineer at Cleveland, O. He will also act as a consultant to the National Advisory Committee for Aeronautics. In addition he has been appointed President of the newly established Metals Research Associates, Inc., Cleveland 6, O. Dr. Sachs has been awarded the U.S. War and Navy Departments' Certificate for an outstanding contribution to the work of the OSRD during World War II. This honour was conferred in recognition of his assistance to the aircraft industries rendered as director of NDRC and OPRD projects at Case Institute of Technology, Cleveland, O. Case Institute was also

NEWS AND ANNOUNCEMENTS

awarded, in 1944, the Distinguished Army Service Award for the development work on cartridge-case fabrication which was directed by Dr. Sachs.

MR. J. D. SWINDALE is now a metallurgical assistant in the Scientific Department, Railways Executive (London Midland Region), Derby.

MR. D. E. J. TALBOT has joined the staff of the Research Laboratories of The British Aluminium Co., Ltd., Chalfont Park, Gerrards Cross.

MR. S. S. TAYLOR has been elected Chairman of the Copper Development Association, to fill the vacancy caused by the resignation of The Hon. R. M. Preston, who has held that office since 1945.

MRS. C. F. TIPPER, who was recently awarded the degree of Doctor of Science of the University of Cambridge, has been appointed a reader in the Engineering Department of the University.

MR. L. WORTLEY has taken up a position in the Admiralty Materials Laboratory, Holton Heath, nr. Poole, Dorset.

MARRIAGE

Miss G. M. L. Cox, metallurgist with Aluminium Laboratories, Ltd., Banbury, to Mr. G. D. Gent of Tormartan, Glos., on 8 October.

JOINT ACTIVITIES

MOND NICKEL FELLOWSHIPS

The Mond Nickel Fellowships Committee have announced the following awards for 1949:

MR. J. MONAGHAN (Stewarts and Lloyds, Ltd.): to study the method of control and administration of basic open-hearth operation and practice in the steel industry in the United States of America.

MR. R. STEWARTSON (The United Steel Companies, Ltd.): to study the design and operation of modern hot-rolling-mill plant in the United States of America.

NEWS OF LOCAL SECTIONS

LONDON LOCAL SECTION

Some Unsolved Problems in the Aluminium Industry

At a meeting of the London Local Section held at the Royal School of Mines, S.W.7, Dr. C. J. Smithells, Director of Research, The British Aluminium Co., Ltd., gave a lecture under the title "Some Unsolved Problems in the Aluminium Industry".

The lecturer reviewed briefly the processes in general use for the production of aluminium from bauxite, drawing attention to

NEWS AND ANNOUNCEMENTS

directions in which improvements might still be expected. Alternative methods for the production of aluminium were considered, and the difficulties still to be overcome before these processes could be competitive were indicated.

Dr. Smithells then passed to the manufacture of wrought aluminium alloys, and considered in some detail the main technical problems for which the industry was still seeking solutions. The importance of a clear understanding of the role played by gas reactions, inclusions, and other impurities in the production of sound rolling blocks was stressed, and the research methods being employed to attack these were described. Some account was given of the application of ultrasonic methods to the study of problems associated with melting and casting. The advantages and disadvantages of the semi-continuous casting process were considered. The mechanical properties of the standard aluminium alloys were reviewed, and an indication of the direction in which further improvements were to be sought was given.

OTHER NEWS

THE INSTITUTION OF METALLURGISTS

The following were elected to the various grades of membership on 16 June 1949:

As Fellows

- BIERS, Howard William Richard, B.Sc., Sc.M. (Union Carbide and Carbon Corporation).
CARAPPELLA, Louis Anthony, B.S., M.S., Sc.D. (Westinghouse Atomic Power Division).
FASSOTTE, Paul Charles (Consultant).
GEACH, George Alwyn, M.Sc., Ph.D. (Associated Electrical Industries, Ltd.).
LEVER, Frank Mercer, B.Sc., A.R.C.S. (Johnson, Matthey and Co., Ltd.).
LEWKONJA, Kurt, Dr.Ph. (Copper and Alloys, Ltd.).
STOKOWIEC, Zygmunt, (David Brown Foundries Co.).

As Fellows from Grade of Associate

- FOOTE, George Buchanan, B.Sc. (Southern Forge, Ltd.).
McMILLAN, Quintin Campbell (Clyde Alloy Steel Co., Ltd.).
REES, Taliesin David, M.Sc. (British Aluminium Co., Ltd.).
SYMONDS, Hubert Henry (Midland Laboratory Guild (1928), Ltd.).

As Associates

- ATKINSON, Denzil Malcolm, B.Sc. (E. and E. Kaye, Ltd.).
CHATTERJEE, Chittaranjan, M.Sc. (Indian Standard Metal Co., Ltd.).
FEASEY, Sidney Thomas (Mining and Chemical Products, Ltd.).
GARDNER, Lucien Ernest, A.Met. (Edgar Allen and Co., Ltd.).
HARRY, Evan Donald, B.Sc. (Steel Company of Wales, Ltd.).

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- HOLDEN, Harry Ashton, M.Sc., A.R.C.S., D.I.C. (The Pyrene Co., Ltd.).
JERMY, Kenneth Edward, M.A. (British Iron and Steel Research Association).
LAHR, Henry Raymond, Dipl.Ing. (Dorman, Long and Co., Ltd.).
LORD, William Martin, B.Sc.Tech. (The Sandholme Iron Co., Ltd.).
LOWE, Frederick Mervyn, B.Sc. (Ministry of Supply).
MENDS, David Nisbet, B.Sc. (British Non-Ferrous Metals Research Association).
MORRIS, Charles Edward, M.A. (Guest, Keen and Nettlefolds (Midlands), Ltd.).
NICHOLSON, Jack, B.Sc. (Mining and Technical College, Barnsley).
SPENCE, Neville Spence, B.Sc. (Dominion Magnesium, Ltd.).
THORNE, Robert Percy, B.Sc. (Langley Alloys, Ltd.).

As Associates from Grade of Licentiate

- CONNOLLY, Brian Jolliffe, B.Sc. (Imperial Chemical Industries, Ltd., Billingham Division).
DOOLEY, Jack, B.Sc. (Thos. Bolton and Sons, Ltd.).
ECCLESTON, Anthony James, B.Sc. (Joseph Lucas, Ltd.).
HAYES, William Eamon Vincent, B.Met. (Wm. Jessop and Sons, Ltd.).
PATEMAN, Leonard William, B.Eng. (David Brown Foundries Co.).
WALSH, Stanley (Chloride Electrical Storage Co., Ltd.).

As Licentiates

- AXON, Howard James, B.Met., D.Phil. (University of Manchester).
HALLE, Charles Edwin Henton (Cerro de Pasco Copper Corpn., Peru).
MCCONNELL, Alexander McDonald (Vulcan Boiler and General Insurance Co.).
PATHAK, Bhasker Ramchandra, M.Sc.
ROBINSON, Edgar Llewellyn (Treharne and Davies, Ltd.).
STRODE, Ivor (The Glanmore Foundry and Engineering Co., Ltd.).
WILSON, Terence Harold, B.Sc. (Ford Motor Co., Ltd.).
WOOTEN, Stanley Ernest (Rover Co., Ltd.).

The following were elected to the various grades of membership on 13 July 1949 :

As Fellows

- DOBSON, Charles Stuart, B.Sc. (Consultant).
JAZWINSKI, Stanislaw Teodor, M.Sc., Dipl.Ing. (Cia. Ferro e Aco Vitoria).

As Fellows from the Grade of Associate

- KESTERTON, Arthur John, M.Eng., Ph.D. (Steel Company of Wales, Ltd.).
MCNEIL, John Frederick, B.Met.E. (Defence Research, S. Australia).

As Associates

- BERRIMAN, Ronald Watkin (Australian Aluminium Co. Pty., Ltd.).
HAWKSWORTH, Kenneth Ernest, A.Met. (Royal Naval Scientific Services).

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- HOPKIN, Llewellyn Morgan Thomas, B.Sc., A.R.S.M. (British Non-Ferrous Metals Research Association).
JOSEPH, William Myrddin, B.Sc. (Metal and Produce Recovery Depot).
KEMMISH, Walter Bolton (C.V.A. Jigs, Moulds and Tools, Ltd.).
KORNFELD, Konrad, Inz.Met.
KOSARSKI, Zbigniew Zdzislaw Jerzy, M.Sc. (The Sheepbridge Stokes Centrifugal Castings Co., Ltd.).
MAVROCORDATOS, Constantin Etienne, B.Met. (English Steel Corporation, Ltd.).
NAISMITH, John Andrew, B.Sc. (W. T. Flather, Ltd.).
PAUL, William Douglas, B.Sc. (Deloro Stellite, Ltd.).
PORGES, Leo, Dipl.Ing. (A. Johnson and Co. (London), Ltd.).
RAE, Dennis Malcolm, B.Sc. (Royal Naval Scientific Services).
SMITH, Stanley James William (Stewarts and Lloyds, Ltd.).
WILLIAMS, Laurence Henry, B.Sc., A.R.S.M. (Industrial Newspapers, Ltd.).
ZEA, Yue-Kuz, B.Sc., Ph.D. (Consultant).

As Associates from Grade of Licentiate

- BAILEY, William Howard, A.Met. (William Jessop and Sons, Ltd.).
BRADSHAW, Anthony Vernon, B.Sc., A.R.S.M. (Mason and Barry, Ltd.).
BROADLEY, John Stewart, B.Sc. (Research Student, Glasgow University).
DOVEY, Douglas Marshall, M.A. (General Electric Co., Ltd.).
HODIERNE, Francis Arthur, B.Sc. (Tube Investments, Ltd.).

As Licentiates

- BANERJI, Abanti Kumar, M.Sc. (E.I. Railway, India).
CHAKRAVARTY, Khagendra Nath, M.Sc. (Metal and Steel Factory, Ishapore, India).
HARRIS, John Geoffrey, B.Sc. (James Booth and Co., Ltd.).
MISSRA, Madan Mohan, B.Sc. (B.N. Railway, India).
ODBER, Leslie Frederick (Colvilles, Ltd.).
SETH, Bhim Sain, B.Sc. (Metal and Steel Factory, Ishapore, India).
SILK, Stanley Joseph, A.C.T.C. (B.K.L. Alloys, Ltd.).
SOUTHWICK, David Kenneth (Bradley and Foster, Ltd.).
WEBB, Harold William (Johnson, Matthey and Co., Ltd.).
WHITEHOUSE, Richard William (Cannon Iron Foundries, Ltd.).

Examinations 1949

The Institution's Examinations were held from 29 August to 6 September 1949 at four centres in Great Britain, viz. Birmingham, Glasgow, London, and Swansea. The pass list is as follows:

Fellowship : *Evans, F. C. (Gerrards Cross).

Associateship : †Allon, F. R. H. (Southampton); †Dunthorne, H. B. (Slough); †Hull, W. G. (Slough); †Morton, G. R. (Kettering).

* Associate.

† Licentiates.

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Licentiateship : Cockle, J. E. S. (Beckenham); Harwood, E. S. (Birmingham); Moore, J. P. (London); Savage, T. R. (Sunderland); Ward, E. (Doncaster); Watson-Adams, B. R. (Ashford).

The following candidates satisfied the Examiners in the *Licentiate*ship Examination and *Associate*ship Examination, respectively, but their election to the grade of Licentiate and Associate is deferred until they have been able to comply with the regulations in respect of age and experience : Miodownik, A. P. (London), and Wilson, A. (Glasgow).

"MODERN VIEWS OF THE SOLID STATE"

The University of Birmingham Extra Mural Department, in co-operation with the Departments of Metallurgy and Chemistry, is arranging a course of lectures in the New Year for research workers in industry. This series of twenty-four lectures, the most comprehensive which the University has so far provided extra-murally for industry, commences on 14 January at the University, Edmund Street.

The idea of the course was originally conceived by members of the Institute of Physics and the Institute of Metals, and was planned in response to a request made by them to the Extra Mural Department. The course has the general title "Modern Views of the Solid State". An introductory section on the general theoretical background of wave mechanics (F. R. N. Nabarro) leads on to more specialized courses dealing with non-metallic solids (J. E. B. Randles) and with metals and alloys (B. A. Bilby).

Enquiries about the course should be sent to the Director of the Extra Mural Department, Edmund Street, Birmingham 3.

DIARY FOR JANUARY

LOCAL SECTIONS MEETINGS

THURSDAY, 5 JANUARY

Birmingham Local Section.—Dr. T. P. Hoar: "Corrosion Testing". (James Watt Memorial Institute, Great Charles Street, Birmingham, at 6.30 p.m.)

London Local Section.—L. A. J. Lodder: "Zinc Casting Alloys: Their Development and Use". (4 Grosvenor Gardens, S.W.1, at 7 p.m.)

MONDAY, 16 JANUARY

Scottish Local Section.—Visit to the Works of S. Smith and Sons (England), Ltd.

TUESDAY, 17 JANUARY

South Wales Local Section.—Films of Metallurgical Interest. (Metallurgical Department, University College, Singleton Park, Swansea, at 6.30 p.m.)

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THURSDAY, 26 JANUARY

Birmingham Local Section.—S. W. K. Morgan: "The Sintering of Zinc Ore and Distillation of Zinc". (James Watt Memorial Institute, Great Charles Street, Birmingham, at 6.30 p.m.)

Sheffield Local Section.—Dr. J. C. Chaston: "Silver-Copper Alloys, with Special Reference to the Temper-Hardening of Sterling Silver". Joint Meeting with the Sheffield Branch of the Electrodepositors' Technical Society. (Grand Hotel, Sheffield, at 6.30 p.m.)

OTHER MEETINGS

TUESDAY, 3 JANUARY

Electrodepositors' Technical Society, Midlands Centre.—C. Wharrad opens discussion on "Practical Plating Problems". (James Watt Memorial Institute, Great Charles Street, Birmingham 3.)

THURSDAY, 5 JANUARY

Institution of Production Engineers, Glasgow Section.—Informal Discussion on "Metal Cutting". (39 Elmbank Crescent, Glasgow, C.2, at 8 p.m.)

Leeds Metallurgical Society.—Film: "The Bragg Soap Bubble". (Chemistry Department, The University, Leeds 2, at 7 p.m.)

FRIDAY, 6 JANUARY

Institution of Mechanical Engineers, Industrial Administration and Engineering Production Group.—J. S. Turnbull: "The Lost-Wax Process of Precision Casting". (The Institution, Storey's Gate, London, S.W.1, at 5.30 p.m.)

Institution of Structural Engineers, Western Counties Branch.—Lecture on "Corrosion". (Merchant Venturers' Technical College, Bristol, at 6.15 p.m.)

TUESDAY, 10 JANUARY

Institute of British Foundrymen, Coventry Students' Section.—J. H. Partridge: "Magnesium Founding in Theory and Practice". (Room A5, Coventry Technical College, at 7.15 p.m.)

WEDNESDAY, 11 JANUARY

Institute of British Foundrymen, Birmingham Students' Section.—Dr. V. Kondic: "Control and Measurement of Casting Fluidity". (Chamber of Commerce, New Street, Birmingham, at 7.15 p.m.)

Institute of British Foundrymen, Lancashire Branch.—F. Hudson: Film display on "Bronze Founding". (Engineers' Club, Albert Square, Manchester, at 7 p.m.)

Liverpool Metallurgical Society.—M. W. Thring: "Recent Developments in the Study of the Flow of Steel". Joint Meeting with the North Wales Metallurgical Society. (Council School, Plymouth Street, Shotton.) This lecture will be preceded by a visit to the works of Messrs. John Summers and Sons, Ltd., Shotton, Flintshire, at 3 p.m.

NEWS AND ANNOUNCEMENTS

THURSDAY, 12 JANUARY

Institute of British Foundrymen, Lincolnshire Branch.—J. F. Barnes: "Some Core-Making Problems". (Lincoln Technical College, at 7.15 p.m.)

Institution of Production Engineers, Halifax Graduate Section.—W. Wall: "Metal Spraying". (Halifax Municipal Technical College, at 7 p.m.)

FRIDAY, 13 JANUARY

Institution of Production Engineers, Eastern Counties Section.—A. Short: "Industrial Applications of the Lost-Wax Process". (Lecture Hall, Electric House, Ipswich, at 7.30 p.m.)

SATURDAY, 14 JANUARY

Swansea Metallurgical Society.—Dr. D. F. Marshall and H. C. White: "The Conversion to Oil-Firing of the Open-Hearth Furnaces at Park Gate Works". Joint Meeting with the Iron and Steel Institute. (The Central Library, Swansea, at 6.30 p.m.)

TUESDAY, 17 JANUARY

Institute of British Foundrymen, Slough Section.—J. Howard Williams: "Casting Inspection". (Lecture Theatre, High Duty Alloys, Ltd., Slough, at 7.15 p.m.)

WEDNESDAY, 18 JANUARY

Manchester Metallurgical Society.—Dr. J. Ward: "Photoelasticity". (Engineers' Club, Albert Square, Manchester, at 6.30 p.m.)

THURSDAY, 19 JANUARY

Institute of British Foundrymen, Burnley Section.—W. E. Connah: "Some Reflections of the Jobbing Foundryman". (Mechanics Institute, Manchester Road, Burnley, at 7.30 p.m.)

Institution of Mining and Metallurgy.—J. P. Norrie and W. T. Pettijohn: "An Outline of Underground Operations at Mufulira Copper Mines, Ltd." (Geological Society, Burlington House, Piccadilly, W.1, at 5 p.m.)

FRIDAY, 20 JANUARY

Institute of Physics, Manchester and District Branch.—J. A. Hall: "Temperature Measurement". (New Physics Theatre, University of Manchester, at 7 p.m.)

SATURDAY, 21 JANUARY

Institute of British Foundrymen, Bristol Branch.—W. Wilson: "The Production of a Large Pulley in Aluminium". (Grand Hotel, Broad St., Bristol, at 3 p.m.)

MONDAY, 23 JANUARY

Institution of Production Engineers, Coventry Graduate Section.—Mr. Robinson: "Die-Casting". (Geisha Café, Hertford Street, Coventry, at 7.15 p.m.)

NEWS AND ANNOUNCEMENTS

WEDNESDAY, 25 JANUARY

Institute of British Foundrymen, London Branch.—Findlay Sievewright: "Towards a New Thought on Education for Foundry Personnel". (Waldorf Hotel, Aldwych, London, W.C.2, at 7.30 p.m.)

Institution of Production Engineers, Shrewsbury Sub-Section.—"Modern Die-Forging Practice". (Walker Technical College, Oakengates, at 7.30 p.m.),

MONDAY, 30 JANUARY

Institution of Production Engineers, North-Eastern Section.—A. Messenger: "Protective Finishes". (Neville Hall Mining Institution, Westgate Road, Newcastle-upon-Tyne 1, at 7 p.m.)

APPOINTMENTS VACANT

To conform to the requirements of the Control of Engagements Order, 1947, these advertisements are published for the information only of those who are "excepted persons" under the Order.

CHEMIST required for routine analysis of lead products. New Laboratory. Good products and generous salary according to experience and qualifications. Box No. 286, Institute of Metals, 4 Grosvenor Gardens, London, S.W.1.

VACANCY occurs for CHIEF METALLURGIST. Applicant should have thorough knowledge of non-ferrous metals, including light alloy, fabrication processes, and handling of furnaces. Please reply in writing stating age, experience, qualifications, and salary required to Delaney Galley, Ltd., Vulcan Works, Edgware Road, Cricklewood, London, N.W.2.

"COLD WORKING OF BRASS"

● SPECIAL REFERENCE TO 70-30 CARTRIDGE BRASS

BY L. E. GIBBS, TECHNICAL ADVISOR, ROME DIV., REVERE COPPER AND BRASS, INC.

Written out of a wealth of experience with the manufacture of articles of the copper alloys, brasses and bronzes, this book has special emphasis on 70-30 cartridge brass. Mr. Gibbs was consulted on innumerable problems connected with the manufacture of ammunition in hundreds of war plants throughout the United States, where the problems of production are intensified, and the quality of the product is paramount.

While the book touches on the problems arising in the brass mill—the producer's problem—it is mostly concerned with the troubles that may arise in the consumer's plant, and that may be cured by a slight change in the treatment of the metal. It is confined more to metallurgical problems than to the mechanical problems.

Individual chapters are given over to discussion of hardness and grain size, effect of cold working and annealing, of minor changes in chemical composition, the testing and inspection of brass strip and brass cups, typical manufacturing problems (as exemplified by the production of 20 mm. cartridges), and the cause and cure of season cracking. Book features illustrations in natural colour of the microstructure of the principal copper alloys.

Orders can be placed through your regular bookdealer, or through the Penton Publishing Company, 2 Caxton St., Westminster, London.

AMERICAN SOCIETY FOR METALS

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BULLETIN ANALYTIQUE

Publication of the Centre National de la Recherche Scientifique, France

The *Bulletin Analytique* is an abstracting journal which appears monthly in two parts, Part I covering scientific and technical papers in the mathematical and physical sciences and their applications, Part II the biological sciences.

The *Bulletin*, which started on a modest scale in 1940, with an average of 10,000 abstracts per part, now averages 35,000 to 45,000 abstracts per part. The abstracts summarize briefly papers in scientific and technical periodicals received in Paris from all over the world, and cover the majority of the more important journals in the world scientific press. The scope of the *Bulletin* is constantly being enlarged to include a wider selection of periodicals.

The *Bulletin* thus provides a valuable reference book both for the laboratory and for the individual research worker who wishes to keep in touch with advances in subjects bordering on his own.

A specially interesting feature of the *Bulletin* is the microfilm service. A microfilm is made of each article as it is abstracted, and negative microfilm copies or prints from microfilm can be purchased from the editors.

The subscription rates for Great Britain are 4000 frs. (£5) per annum for each part. Subscriptions can also be taken out to individual sections of the *Bulletin* as follows:

	<i>frs.</i>	£	<i>s.</i>	<i>d.</i>
Pure and Applied Mathematics—Mathematics— Mechanics	550		14	6
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General Physics—Thermodynamics—Heat— Optics—Electricity and Magnetism	900	1	2	6
Atomic Physics—Structure of Matter	325		8	6
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Inorganic Chemistry—Organic Chemistry— Applied Chemistry—Metallurgy	1800	2	5	0
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Subscriptions can be paid directly to the editors: Centre National de la Recherche Scientifique, 18 rue Pierre-Curie, Paris 5ème. (Compte-chèque-postal 2500-42, Paris), or through Messrs. H. K. Lewis & Co., Ltd., 136 Gower St., London, W.C.1.

THE INSTITUTE OF METALS

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Lieut.-Colonel S. C. GUILLAN, T.D.

Editor :

N. B. VAUGHAN, M.Sc., F.I.M.

Assistant Secretary :

Major R. E. MOORE

Administrative and Editorial Offices :

4 GROSVENOR GARDENS, LONDON, S.W.1

Telephone :

SLOANE 5928 & 6233

A NEW YEAR MESSAGE FROM THE PRESIDENT

One of the more pleasing duties of the President is to send to his fellow members a personal greeting at this season of the year. In doing so once again I assure you this pleasant custom is no mere formality but a genuine expression of that goodwill and comradeship which I know exists throughout the Institute.

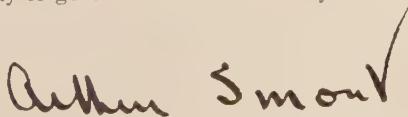
I would particularly, on this occasion, extend the hand of fellowship to our members overseas and say how delighted I was personally to greet so many of them at the Paris meeting last autumn—a meeting which will linger long in the memories of all who were fortunate enough to be able to participate in it.

I referred last year to the opportunity presented to us all in these difficult times for personal service and recalled that the measure of service which the Institute can render is directly proportional to the support it receives from each and every member. The Institute is no stronger than its component parts. Our objects are to promote the science and practice of non-ferrous metallurgy and to afford a means of communication between all persons, whether members or not, who are interested in all aspects of metallurgy except those relating to extraction and iron and steel, which are catered for by other Institutes. Our progress, like that of all branches of learning, is largely dependent on the free and full interchange of knowledge amongst workers pursuing similar lines of study. This is why the Institute of Metals was brought into being and is the sole justification for its existence.

To achieve its objects and attain its objectives the Institute must be strong. While increased membership is important, strength is not entirely a matter of numbers. The contribution each and every member is prepared to make to the well-being of the whole Institute is an even greater source of strength. Your Council wants to see an ever-increasing participation in the everyday work of the Institute by what is sometimes called "the ordinary member". Alas, too many are still inclined to "leave it to George".

Since the war there has been a general quickening of the Institute's activities. During the past year we have made considerable progress towards attaining our ideals, and the Institute is rapidly taking its place in world affairs as the accredited learned society in the field of non-ferrous metallurgy.

We have still a long way to go but we are on our way.





This photograph was taken during the Osmond Centenary Celebrations held in Paris last October. It shows Professor Carl A. F. BENEDICKS of Stockholm (the first recipient of the Osmond Medal of the Societe Francaise de Metallurgie) illustrating his remarks in the course of a tribute to Osmond, by means of a sword belonging to Professor A. M. PORTEVIN (left foreground). Both Professor Benedicks and Professor Portevin are Honorary Members of the Institute of Metals. Between them can be seen (full face) Col. N. T. BELAIEV, a former Honorary Corresponding Member to the Council.

INSTITUTE NEWS AND ANNOUNCEMENTS

MEMBERSHIP

For the first time in the Institute's history, the membership exceeds 3500.

The Council is anxious that this total shall be largely increased, so that the Institute's work and services may be maintained and improved. All members are invited to take really active steps to increase the membership of the Institute in their own circles of those who are qualified to be members and should support the Institute. The Institute's publications should be of benefit to every non-ferrous metallurgist.

JOURNAL AND METALLURGICAL ABSTRACTS: BINDING CASES

Binding cases for the 1948 volumes of the *Journal* and *Metallurgical Abstracts* have been sent to all members and subscribers who have applied for them.

Bound copies of these volumes (*Journal*, vol. 74; *Metallurgical Abstracts*, Vol. 15) are available. The published price is £3 (or \$9.00) per volume, post free; each member may obtain one copy of each at 50% discount, viz. £1 10s. (or \$4.50), post free.

PRICES OF PUBLICATIONS

Because of continued increases in printing and binding costs, and to cover overhead charges which have not hitherto been sufficiently taken into account, the published prices of the books of the Institute's Monograph and Report Series have been revised with effect from 1 December 1949.

A full scale of prices of the Institute's publications, quoted in sterling and in U.S. dollars, will be found on p. 75.

VISIT TO COLLEGE OF AERONAUTICS, CRANFIELD

A number of members of the Institute, including the President (Sir Arthur Smout, J.P.), visited the College of Aeronautics at Cranfield, by invitation of the Principal, on Wednesday, 15 December.

The College, which occupies the site of a former R.A.F. station about 10 miles south-west of Bedford, was set up by the Government at the end of the last war to provide a high-grade engineering, technical, and scientific training in aeronautics to fit students for leadership in the aircraft industry, civil aviation, the Services, education, and research. For this purpose a two-year course is given to selected students of graduate standard (though the possession of a degree is not an essential condition of entry). Shorter courses for specialists in particular subjects are held from time to time, as facilities permit and as needs become apparent.

The College contains four main departments, dealing respectively with aerodynamics, aircraft design, aircraft economics and production, and aircraft propulsion. All were visited by the Institute of Metals party under the guidance of the various Heads of departments, and a very interesting and instructive day was spent by those members who participated.

NEWS AND ANNOUNCEMENTS

CORRIGENDUM TO PAPER No. 1210

In the paper by Mr. L. E. Samuels on "The Metallography of Copper Containing Small Amounts of Bismuth", published in the September, 1949, issue of the *Journal*, the following emendation should be made:

The sentence in the third paragraph of p. 99 reading "Concentration of solute atoms at the grain boundaries would increase with decreasing temperature" should be replaced by: "Concentration of solute atoms at the grain boundaries could occur only at temperatures below the solubility temperature of the solute in the interior of the grain, the tendency to segregation increasing as the temperature falls below the solubility temperature."

DISCUSSION OF PAPERS

In order to assist the Committee responsible for arranging the programmes of the General Meetings of the Institute, will all members who are prepared to discuss orally any of the papers published in the *Journal* from September 1949 onwards, please inform the Secretary as soon as possible.

It is hoped that such information will enable programmes to be arranged which will secure well attended and lively discussions.

ELECTION OF ORDINARY MEMBERS AND STUDENT MEMBERS

The following 13 members and 19 student members were elected on 31 December 1949:

Ordinary Members

BANKS, Clarence Kenneth, A.B., B.Sc., M.Sc., Ph.D., Director of Research and Development, Metal and Thermit Corporation, Box 255, Rahway, N.J., U.S.A.

BARNES, Sidney Mellish, Director and Technical Representative, Barronia Metals (Great Britain), Ltd., Hereford.

DOWDING, Michael Frederick, M.A., Research Engineer, Davy and United Engineering Co., Ltd., Park Iron Works, Sheffield 4.

FODOR, Gabriel, Technical Director, Société Anonyme Gilby-Wire, 29 Quai de la Marne, Rueil-Malmaison (S. et O.), France.

HERNE, Howard James Louis, M.A., Mathematician, The British Iron and Steel Research Association, Physics Laboratories, 104 Battersea Park Road, London, S.W.11.

HOLTH, Tore, M.Sc., Scientific Officer, Norwegian Defence Research Establishment, Lillestrom, Norway.

MERCER, Randolph, B.Sc., Technical Manager, Enfield Rolling Mills (Aluminium), Ltd., Bradford Works, Bowling Back Lane, Bowling, Bradford, Yorkshire.

NEWS AND ANNOUNCEMENTS

- MILLWARD, Humphrey John, Chief Metallurgist, Light Alloys, Sterling Metals, Ltd., Northey Road, Coventry, Warwickshire.
- RATHENAU, Gerhart W., Research Physicist, Research Laboratory, N.V. Philips' Gloeilampenfabrieken, Eindhoven, Holland.
- REITSEMA, R., Director of the Department for Metals, Centraal Instituut voor Materiaalonderzoek, Delft, Holland.
- RUSSELL, John, Representative, Engineering 'Trades' Department, Imperial Chemical Industries, Ltd.; (mail) 32 Dorian Drive, Clarkston, Renfrewshire.
- WAINE, Fred, J.P., Executive Director, British Insulated Callender's Cables, Ltd., Surrey House, Temple Place, London, W.C.2.
- WILLIAMS, Cyril Hector, Development Engineer and Metallurgist, Barronia Metals (Great Britain), Ltd., Hereford.

Student Members

- ASBURY, Frederick Ernest, Student of Metallurgy, Sheffield University.
- BIGGS, William Derrick, B.Sc., Metallurgist, Research Department, Murex Welding Processes, Ltd., Waltham Cross, Hertfordshire.
- BOURNE, Alan Arthur, Johnson, Matthey and Co., Ltd., Exhibition Grounds, Wembley, Middlesex.
- CHATTERJEE, Asit Kumar, B.Sc., B.Met., Lecturer in Metallurgy, B.E. College, P.O. Botanic Gardens, Howrah, Calcutta, India.
- CHILTON, John Pollock, Student of Metallurgy, Cambridge University.
- DAVIES, Colin James, Technical Assistant, Imperial Chemical Industries, Ltd., Metals Division, Waunarlwydd, near Swansea.
- DAVIS, Richard John, B.A., Research Student, Oxford University.
- ELLIOTT, Ronald, Student of Metallurgy, Leeds University.
- EVANS, Brian, M.A., Metallurgist, Enfield Rolling Mills, Ltd., Brimsdown, Enfield, Middlesex.
- GREGG, John Fleming, Student of Metallurgy, University College, Swansea.
- HAMPTON, Donald, Assistant Experimental Officer, Royal Arsenal, Woolwich, London, S.E.18.
- HESLOP, John, Student of Metallurgy, Leeds University.
- HUDSON, Robert Frederick, B.Met.E., Metallurgist, Commonwealth Aircraft Corporation Pty., Ltd., Box 7794, G.P.O., Melbourne, Victoria, Australia.
- JESSOP, Alan Fields, Student of Metallurgy, Birmingham University.
- JOHANNSSON, Thor, Student of Metallurgy, Constantine Technical College, Middlesbrough, Yorkshire.
- NODEN, Joseph Desmond, B.Sc., Research Student, Birmingham University.
- OLDS, Geoffrey Charles Edward, B.Sc., Physicist, Research Laboratory, The British Thomson-Houston Co., Ltd., Rugby, Warwickshire.
- SAMUEL, Philip, B.Met., Research Student, Sheffield University.
- WAINHOUSE, Donovan Michael, Student of Metallurgy, Leeds University.

PERSONAL NOTES

DR. L. C. BANNISTER is leaving British Insulated Callender's Cables, Ltd., and will shortly join the Research and Development Department of the British Oxygen Co., Ltd.

DR. W. BOAS was recently appointed Chief of the Division of Tribophysics of the Commonwealth Scientific and Industrial Research Organisation. He has also been elected Chairman for 1950 of the Physical Metallurgy Division of the Melbourne Branch of the Australian Institute of Metals.

MR. G. J. BRITTINGHAM has resigned from the position of Manager of the Electrolytic Refining and Smelting Company, Port Kembla, N.S.W., to set up in practice as a metallurgical consultant.

MR. H. N. CHATTOPADHYAY has been awarded the degree of B.Sc.(Met.) by the Benares Hindu University and has joined the staff of the Tata Iron and Steel Works.

MR. BERNARD D. CULLITY has resigned his post as a Scientific Liaison Officer for the U.S. Office of Naval Research in London to take up an appointment as Assistant Professor of Metallurgy at the University of Notre Dame, Notre Dame, Ind., U.S.A.

MR. W. DEMAINE has joined the Rhokana Corporation, Ltd., and his address is now P.O. Box 137, Kitwe, Northern Rhodesia.

MR. L. W. DERRY has been appointed to succeed Dr. Naish as Head of the Metallurgical Department at Battersea Polytechnic.

DR. C. H. DESCH has recently been installed as President of the Newcomen Society.

MR. E. ELLIOTT has been appointed Information Officer to the Aluminium Development Association, having served for some time as Liaison Officer and Secretary to the Association's technical committees.

MR. F. B. ELLIOTT has been appointed Lecturer in Metallurgy at the Northampton Polytechnic, London, E.C.1.

DR. FRANCIS C. FRARY has been awarded the James Douglas Metallurgical Medal of the American Institute of Mining and Metallurgical Engineers "for distinguished achievement in science and contribution to society by broadening the field of knowledge in all phases of the aluminium industry, and for his notable success in directing a vast research project in his industry".

DR. A. J. GOULD has been awarded the degree of D.Sc. of London University.

PROFESSOR J. N. GREENWOOD has now returned to Australia after his visit to Europe, in the course of which he attended the Autumn Meeting of the Institute in Paris.

COLONEL SIR PAUL GUETERBOCK, who underwent a serious operation at the London Clinic in December, is making a good recovery. He will not, however, be able to resume his business and numerous other activities for a considerable time.

MR. A. JAYARAMAN is a Research Assistant at the Raman Research Institute, Hebbal, Bangalore, India.

NEWS AND ANNOUNCEMENTS

MR. K. S. JEPSON has now taken up an appointment in the Metallurgy Department, Royal Aircraft Establishment, Farnborough, Hants.

MR. G. P. KEMPSON, having obtained his degree in Metallurgy at Cambridge, is now with Henry Wiggin and Co., Ltd., Birmingham.

MR. J. G. LEWIS has left Pyrotenax, Ltd., and taken a post in the Research Department of the Imperial Tobacco Co., Ltd., Bristol.

MR. JAMES MOWAT has been appointed a Special Director of Messrs. Wm. Beardmore and Co., Ltd., Glasgow, of which firm he is Chief of the Research Department.

MR. P. BARRY PARKS has severed his connection with the Hong Kong and Whampoa Dock Co., Ltd., after nearly 17 years with them as Metallurgist and Foundry Manager. Mr. Parks is now in Sheffield on leave and hopes to go abroad again in the near future in a technical representative capacity.

MR. B. R. PATHAK has been appointed Lecturer in Physical Metallurgy at the College of Engineering, Poona, India.

DR. J. G. PEARCE, Director of the British Cast Iron Research Association, was gazetted O.B.E. in the New Year Honours' List.

PROFESSOR SUBRAMANYA RAMAMURTHY has been appointed a Member of the Faculty of the Benares Hindu University.

MR. R. R. ROBERTS has left Murex Welding Processes, Ltd., and taken up an appointment in the Research Laboratories of The British Thomson-Houston Co., Ltd., Rugby.

MR. F. W. ROWE has been elected Chairman of the British Steel Founders' Association.

MR. R. S. RUSSELL has been elected President of the Melbourne Branch of the Australian Institute of Metals for 1950. Professor H. K. Worner and Mr. A. F. Dunbar have been re-elected Vice-Presidents.

MR. M. N. SAXENA has joined the Gwalior Thermalite Corporation of Kanpur, India, as a Junior Engineer.

MR. R. C. STANLEY, Chairman of the International Nickel Company of Canada, has been made an Honorary President of the Copper Development Association.

DR. H. UNCKEL is now at the Tekniska Högskolan, Helsingfors, Finland.

DR. D. W. WAKEMAN has been appointed an I.C.I. Research Fellow in Metallurgy at Birmingham University.

MR. D. R. F. WEST has been awarded the degree of Ph.D. of London University and the Diploma of the Imperial College. He is a Scientific Officer in the Armament Research Establishment, Woolwich, S.E.18.

MR. H. W. WORNER is now Senior Research Officer in the Physical Metallurgy Section of the Commonwealth Scientific and Industrial Research Organization, Melbourne.

MR. J. G. YOUNG is now a Research Metallurgist with The British Aluminium Co., Ltd.

NEWS AND ANNOUNCEMENTS

ENGAGEMENT

MR. A. PRINCE, who is now a Trainee Research Metallurgist in the Central Research Laboratories, Imperial Chemical Industries, Ltd., General Chemicals Division, Widnes, has become engaged to Miss Sheila Mary Jacklin of Sheffield.

MARRIAGE

MR. W. A. M. PAWSEY was married at The Oratory, London, S.W.7, on 26 November to Miss Diana Mary Holloway of Beckenham, Kent.

DEATHS

The Editor regrets to announce the deaths of :

MISS D. P. CLAPHAM, of the Ministry of Supply, Fort Halstead, Sevenoaks, Kent, on 29 June 1949.

MR. FREDERIC SEYMOUR TRITTON of Alfriston, Sussex, on 30 December 1949.

NEWS OF LOCAL SECTIONS AND ASSOCIATED SOCIETIES

PRESIDENT'S VISITS TO LOCAL SECTIONS AND ALLIED SOCIETIES

The President (Sir Arthur Smout) accompanied by the Secretary (Lieut.-Colonel S. C. Guilan) intends to pay official visits as follows :

Birmingham Local Section, Thursday, 2 February.

Scottish Local Section, Monday, 13 February.

Manchester Metallurgical Society, Wednesday, 1 March.

London Local Section, Thursday, 9 March.

South Wales Local Section, Tuesday, 14 March.

BIRMINGHAM LOCAL SECTION

Symposium on the Investigation of Alloy Systems

A Symposium on the Investigation of Alloy Systems will be held on Friday, 10 March 1950, at the Chamber of Commerce, New Street, Birmingham, and will be followed by a dinner at the Imperial Hotel. Six papers will be presented and discussed, after which there will be a general discussion of the subject. Those who have promised to contribute papers include Professor D. HANSON (Introductory Address), Dr. C. SYKES, F.R.S. (Thermal Analysis), Professor G. V. RAYNOR (Thermochemistry of Alloys), and Mr. D. McLEAN, B.Sc. (Approach of Alloys to Equilibrium). Advance synopses of the papers will be sent to all those who register to take part in the symposium. Registration fee: 7s. 6d. (inclusive of tea). Lunch at the White Horse Hotel: 7s. 6d. Dinner at the Imperial Hotel: 12s. 6d. Further information can be obtained from the Honorary Secretary, Mr. E. H. BUCKNALL, M.Sc., 264, Harborne Park Road, Harborne, Birmingham, 17.

NEWS AND ANNOUNCEMENTS

LONDON LOCAL SECTION

The first meeting of the session took place at 4 Grosvenor Gardens, London, S.W.1 on 27 October 1949, when Dr. H. M. FINNISTON, of the Atomic Energy Research Establishment, Harwell, gave a lecture on

Radioactive Tracers in Metallurgical Research

The lecturer described the nuclear characteristics of radioactive isotopes, and gave an account of the various particle and ray emissions from radioactive elements and of some of their properties. The principles and methods for detecting and counting the emissions from radio-isotopes were explained and counting equipment and photographic techniques demonstrated. The characteristics of isotopes useful for metallurgical research were defined and examples given of metallurgical investigations in which tracers had been used. These examples covered the fields of metallic diffusion, friction, metal testing, segregation, corrosion, slag-metal reactions, &c. Reference was made to health precautions which have to be observed for the safety of the research worker using radioactive isotopes.

A full account of the lecture is to be published shortly by H.M. Stationery Office.

Casting Copper-Lead Bearings

The casting of copper-lead bearings was the subject of the lecture by Mr. P. D. LIDDIARD and Mr. P. G. FORRESTER which members of the Section attended at the Waldorf Hotel, Aldwych, W.C.2, on 8 December at the invitation of the London Branch of the Institute of British Foundrymen. A synopsis of the lecture is as follows:

The copper-lead alloys have become established bearing metals. Their use has been discussed in numerous papers on bearing alloys published in the technical press, but the metallurgy of the copper-lead system and the problems of casting these alloys have not been considered nearly so frequently. The casting of the alloys by lining on to steel shells has many problems, some not common to the casting of solid bodies. The approach in the present paper was to consider firstly the theoretical aspects, such as the equilibrium diagram of the system, the effect on it of other elements, &c.; from this to summarize the problems which might be anticipated, and then to examine the practical methods which are being used to produce these linings by casting. The methods used in this country, the United States, and on the Continent were critically reviewed and compared; these cover static, centrifugal, and continuous processes.

Change of Date of Meeting

Will members in the London area please note that the date of the meeting of the Local Section announced for Thursday, 6 April, has been changed to Tuesday, 4 April. The meeting, which will take place at 4 Grosvenor Gardens, London, S.W.1, at 7 p.m., will consist of a discussion on "Creep", to be opened by Dr. N. P. ALLEN, Superintendent of the Metallurgy Division, National Physical Laboratory.

NEWS AND ANNOUNCEMENTS

SCOTTISH LOCAL SECTION

At a meeting of the Section held in Glasgow on 14 November 1949, Mr. J. C. BAILEY, Chief Metallurgist of the Aluminium Development Association, lectured on

Aluminium and its Alloys in Relation to Their Use in Building and Civil Engineering

The lecturer gave an outline of the alloys of aluminium in common use, both cast and wrought, and their properties in the various forms now available; their strength, behaviour under stress, durability in service, and forming properties were discussed in relation to building and engineering applications.

The lecture concluded with a brief review of some of the many recent installations in buildings and structures that have been made, illustrated with lantern slides.

SHEFFIELD LOCAL SECTION

On 27 October 1949 at the Grand Hotel, Sheffield, Mr. G. MEIKLE delivered an address on

Aluminium Alloys in Aircraft

In his lecture Mr. Meikle classified the aluminium alloys under three main headings according to their tensile strength: (1) up to 15 tons/in.², (2) 15–25 tons/in.², and (3) 30 tons/in.² and over. Brief reference was made to alloys of the 1½% manganese and 2% magnesium types. Alloys containing 3.5%, 5%, and 7% magnesium were also mentioned. Emphasis was laid on the third group, which includes the Duralumin and Duralumin-type alloys and those of the aluminium–zinc–magnesium group. Alloys used in the cast condition were briefly dealt with, and a short account of the endurance records of the 10% magnesium alloy was given. Reference was also made to the effect of the presence of various compounds on the value of Young's modulus. Methods used in defining specification limits were demonstrated.

At a joint meeting with the Electrodepositors' Technical Society, held at the Mappin Hall, Sheffield, on 25 November 1949, Dr. A. T. STEER delivered an address on

The Influence of Surface Preparation on the Quality of Silver Deposition

The lecturer dealt with the usual methods of preparing surfaces of nickel silver before silver deposition. Reference was made to the use of X-ray back-reflection methods to determine the amount of cold work. The depth of the cold-worked layer was given in terms of μ and Å. units. Numerous slides were shown to illustrate the bad effect of distortion on the "keying" of silver deposits on the substrate. The change in the appearance of surface layers of nickel silvers caused by the removal by an etching reagent of the distorted layer was pointed out. Numerous samples were exhibited to show the results obtained by reversing the usual methods of production of silver-plated articles. Specimens of spoon blanks which had been subjected to an etching treatment followed by plating were shown. The various stages of spoon production in the plated condition were also shown and attention was drawn to the high lustre of the deposit. A theory was advanced to explain the non-adherence of silver deposits and the cause of white spotting on the surface of deposits.

NEWS AND ANNOUNCEMENTS

On 15 December 1949, at the Grand Hotel, Sheffield, Mr. E. DAVIS delivered an address entitled

Recent Progress in Copper and Copper-Base Alloys

The development of foundry practice from small pot melting and casting into small cast-iron moulds to electric-furnace melting and casting into large water-cooled moulds was dealt with. Reference was made to inverse segregation and to the benefits which accrued by control of the melting and casting conditions. The progress made in the design of breaking-down rolls and the development from hand-fed to mechanically-fed rolls was explained.

A general survey of the fabrication of tough-pitch copper and oxygen-free high-conductivity copper was given, together with an account of the effects of addition of a second element such as cadmium, chromium, silver, selenium, sulphur, or tellurium. Particular attention was given to the brasses. By illustration and description, the working, physical, and mechanical properties of α and α/β alloys, with and without such elements as aluminium, arsenic, and lead, were demonstrated. The tin bronzes and the aluminium bronzes were also included.

Tables of temper-hardening copper-base alloys were shown, and the lecturer gave a concise account of the properties and other characteristics of copper-nickel-aluminium, copper-beryllium, and copper-chromium alloys.

OTHER NEWS

INTERNATIONAL TEMPERATURE SCALE

At the Ninth General Conference on Weights and Measures held in Paris in October, 1948, a new International Temperature Scale was adopted, superseding that which has been in use since 1927.

The differences between the specifications of the two scales which lead to changes in the nominal values of certain temperatures are:

(1) The melting point of silver is now defined as 960.8°C . instead of 960.5°C .

(2) The Planck radiation formula has been substituted for the Wien formula.

(3) The value of C_2 in these formulæ has been changed from 1.432 to 1.438 cm. degrees.

There is no difference between the two scales at 630.5°C . and 1063°C ., but 2000°C . and 4000°C . on the 1927 scale are equivalent to 1994°C . and 3958°C ., respectively, on the 1948 scale.

In order to secure international uniformity in nomenclature the General Conference decided to abandon the use of the word "Centigrade" and its French equivalent "Centésimale" in favour of the name Celsius. That is, $^{\circ}\text{C}$. is now to be regarded as the abbreviation of "degrees Celsius".

The National Physical Laboratory adopted the new scale on 1 January 1949, and has produced a report on it, which it is understood will be published by H.M. Stationery Office.

NEWS AND ANNOUNCEMENTS

ELECTRODEPOSITORS' TECHNICAL SOCIETY

Silver Jubilee Conference

A Conference to mark the twenty-fifth Anniversary of the founding of the Electrodepositors' Technical Society will be held at the Grand Hotel, Eastbourne, from Wednesday, 19 April, to Saturday, 22 April 1950.

Technical sessions are being arranged at which papers will be presented and discussed on electropolishing, alloy deposition, and various other subjects connected with electroplating and protective metallic coatings. Further sessions will consist of general discussions at which well-known speakers will introduce topics of such practical interest as metal cleaning, electrical maintenance in the plating shop, and education in the plating industry. Technical sessions will occupy the morning and afternoon of 20 and 21 April and the morning of 22 April.

While strong emphasis is being placed on the organization of a stimulating technical programme, considerable attention is being given to arranging attractive social functions which members and visitors and their ladies will be able to attend. The Conference will open with an informal social gathering on the evening of Wednesday, 19 April. On Thursday evening, the Mayor of Eastbourne will hold a civic reception at the Winter Garden, followed by a dance. The official dinner will take place on the Friday evening. With business finished at lunch time on the Saturday, all those attending will be free to enjoy the outings and other social events being planned for the Saturday afternoon and evening, concluding with a dinner and dance at the Grand Hotel.

The Conference will be open alike to members and non-members of the Society and ladies.

JOINT ENGINEERING CONFERENCE, 1951

The Councils of the Institutions of Civil, Mechanical, and Electrical Engineers have decided to hold, in London, a Joint Engineering Conference from 4 to 15 June 1951, to coincide with the Festival of Britain.

The theme of the Conference will be to place on record the achievements of British engineers, and the Conference will afford an opportunity for the engineers of the world to discuss the future trends in developing the great sources of power in nature for the use and convenience of man. The Conference will also underline the interdependence of all branches of engineering, for none of the great developments in the last 100 years would have been possible without the constant and ever-growing co-operation of the members of the three major engineering Institutions in Great Britain.

Mindful of the importance of maintaining the high standard and technical efficiency of British engineers in the future, the Conference will also discuss the development of the system of education of engineers in Great Britain which, by the achievement of British engineers, has shown itself to be pre-eminently suited to the conditions in this country.

NEWS AND ANNOUNCEMENTS

INTERNATIONAL CONGRESS ON ANALYTICAL CHEMISTRY

Plans are progressing for the holding of an International Congress on Analytical Chemistry in Britain in 1952.

An approach has been made to the Council of the International Union of Pure and Applied Chemistry for its patronage, and at the meeting of the International Union in Amsterdam in September 1949, not only was this patronage given, but also the proposal was thought to be in accord with one of the major decisions taken at that meeting, viz., the formation of six autonomous sections, one of which would be concerned with Analytical Chemistry.

Although these plans of the Union are tentative and will be submitted for final approval in 1951 in Washington, it is likely that a meeting of the Board of this provisionally constituted section on Analytical Chemistry could be arranged to coincide with the Analytical Congress in Britain in 1952.

The Executive Committee, under the Chairmanship of the President of the Society of Public Analysts and Other Analytical Chemists, Mr. G. Taylor, F.R.I.C., has had preliminary discussions with regard to the location of the Congress, publication of the papers, and other matters, and a Sub-Committee is studying the scope of the subjects to be discussed.

The Honorary Secretary of the Congress is Mr. R. C. Chirnside, F.R.I.C., Research Laboratories of The General Electric Co., Ltd., Wembley, England.

INDUSTRIAL FINISHES EXHIBITION

It is announced that the first British Industrial Finishes Exhibition has now been arranged to take place at Earls Court, London, from 30 August to 7 September 1950. It will be concerned mainly with metal finishing, though other finishes will also be included. The Institute is represented on the Honorary Council of the Exhibition by the President (Sir Arthur Smout). Further particulars may be obtained from the organizers, Industrial Finishes Exhibition, Ltd., 26 Old Brompton Road, London, S.W.7.

INSTITUTION OF MINING AND METALLURGY

COLONEL L. C. HILL, D.S.O., M.C., A.R.S.M., Technical Adviser to the Rio Tinto Company, Ltd., has been elected President of the Institution of Mining and Metallurgy for the session 1950-51 and will take office at the Annual General Meeting to be held on 18 May next.

C.D.A. LONDON OFFICE

The London Office of the Copper Development Association, at Grand Buildings, Trafalgar Square, W.C.2, is being transferred to the Association's headquarters, and all communications should now be addressed to the Association at Kendals Hall, Radlett, Herts. (Telephone: Radlett 5616).

NEWS AND ANNOUNCEMENTS

DIARY FOR FEBRUARY

LOCAL SECTIONS MEETINGS

THURSDAY, 2 FEBRUARY

Birmingham Local Section.—A. R. Powell: "Recent Progress in the Production of Some of the Rarer Metals". (James Watt Memorial Institute, Gt. Charles St., Birmingham, at 6.30 p.m.)

THURSDAY, 9 FEBRUARY

London Local Section.—E. J. Vaughan: "Recent Developments and Modern Techniques in Metallurgical Analysis". (4 Grosvenor Gardens, London, S.W.1, at 7 p.m.)

MONDAY, 13 FEBRUARY

Scottish Local Section.—E. J. Bradbury: "The Fabrication of Nickel Alloys". (Institution of Engineers and Shipbuilders in Scotland, 39 Elmbank Crescent, Glasgow, C.2, at 6.30 p.m.)

TUESDAY, 14 FEBRUARY

South Wales Local Section.—Annual General Meeting, followed by lecture by L. G. Beresford: "Technical Journalism and the Metallurgist". (University College, Metallurgical Dept., Singleton Park, Swansea, at 6.30 p.m.)

THURSDAY, 23 FEBRUARY

Birmingham Local Section.—Dr. C. E. Ransley: "Gases in Metals". (James Watt Memorial Institute, Gt. Charles St., Birmingham, at 6.30 p.m.)

Sheffield Local Section.—Dr. E. C. Rhodes: "Precision Casting as Applied to Dentistry and Jewellery". (Grand Hotel, Sheffield, at 6.30 p.m.)

OTHER MEETINGS

WEDNESDAY, 1 FEBRUARY

Institution of Production Engineers, Preston Section.—W. Murray: "Corrosion of Metals". (Clayton, Goodfellow and Co., Ltd., Atlas Iron Works, Park Road, Blackburn, at 7.15 p.m.)

Institution of Production Engineers, Wolverhampton Section.—R. P. Brookes: "Drop Forgings, Production Practice and Application". (Dudley and Staffordshire Technical College, Dudley, at 7 p.m.)

THURSDAY, 2 FEBRUARY

Liverpool Metallurgical Society.—G. L. Bailey: "Use of Non-Ferrous Metals in Marine Applications". (Liverpool Engineering Society's Rooms, 9 The Temple, 24 Dale Street, at 7 p.m.)

NEWS AND ANNOUNCEMENTS

FRIDAY, 3 FEBRUARY

Institution of Production Engineers, West Wales Sub-Section.—E. R. Gadd: "The Metallurgist's Place in Production Engineering". (Y.M.C.A., St. Helen's Road, Swansea, at 7.30 p.m.)

MONDAY, 6 FEBRUARY

Institution of Production Engineers, Yorkshire Section.—C. C. Gladwell: "Industrial Finishes"; followed by a film entitled "The Technique of Spray Painting". (Hotel Metropole, King Street, Leeds 1, at 7 p.m.)

TUESDAY, 7 FEBRUARY

Electrodepositors' Technical Society, Midlands Centre.—Dr. G. E. Gardam opens discussion on "Throwing Power". (James Watt Memorial Institute, Gt. Charles Street, Birmingham 3, at 6.30 p.m.)

Institution of Production Engineers, Wolverhampton Graduate Section.—C. E. Slade: "Resistance Welding". (Dudley and Staffordshire Technical College, Dudley, at 7.15 p.m.)

WEDNESDAY, 8 FEBRUARY

Institution of Production Engineers, Manchester Graduate Section.—W. Howard: "Surface Coating and Synthetic Finishes". (Reynolds Hall, College of Technology, Manchester, at 7.15 p.m.)

WEDNESDAY, 15 FEBRUARY

Institute of Fuel, Yorkshire Section.—F. A. Gray: "The Measurement of Reheating-Furnace Performance". (Royal Victoria Station Hotel, Sheffield, at 6.30 p.m.)

Manchester Metallurgical Society.—R. W. N. Danielson: "Hot Pressing of Brasses". (Engineers' Club, Albert Square, Manchester, at 6.30 p.m.)

THURSDAY, 16 FEBRUARY

Institution of Mining and Metallurgy.—Dr. P. F. Holt: "The Determination of the Mass Concentration of Air-Borne Dusts: An Apparatus for the Sublimation of Volatile Filter Bases"; Dr. J. S. Webb and Mr. A. P. Millman: "Heavy Metals in Natural Waters as a Guide to Ores—a Preliminary Investigation in West Africa"; G. F. Mortimer: "Grade Control". (Geological Society, Burlington House, Piccadilly, London, W.1, at 5.0 p.m.)

Institution of Production Engineers, Glasgow Section.—F. Hudson: "Precision Casting". (Institution of Engineers and Shipbuilders, 39 Elmbank Crescent, Glasgow, C.2, at 7.30 p.m.)

SATURDAY, 18 FEBRUARY

Swansea and District Metallurgical Society.—W. L. Kerlie: "Ingot-Mould Design and Pit Casting Assembly". (Central Library, Swansea, at 6.30 p.m.)

MONDAY, 20 FEBRUARY

Electrodepositors' Technical Society, London Centre.—R. Wall: "Bright Nickel and Chrome Plating (Batch Production)". (Northampton Polytechnic, St. John Street, Clerkenwell, London, E.C.1, at 5.30 p.m.)

NEWS AND ANNOUNCEMENTS

Institution of Production Engineers, North-Eastern Section.—H. Smith: "A Modern Foundry". (Neville Hall Mining Institution, Westgate Road, Newcastle-upon-Tyne, 1, at 7 p.m.)

WEDNESDAY, 22 FEBRUARY

Institution of Production Engineers, South Wales and Monmouthshire Section.—F. Hudson: "Precision Castings for General Engineering Purposes". (South Wales Institute of Engineers, Park Place, Cardiff, at 6.45 p.m.)

FRIDAY, 24 FEBRUARY

Electrodepositors' Technical Society, Sheffield and North-East Centre.—J. H. Johnson: "Plating Practice in a Small Tools Plant". (Grand Hotel, Sheffield, at 6.30 p.m.)

MONDAY, 27 FEBRUARY

Institution of Production Engineers, Manchester Section.—J. McHenry: "Advance of Industrial Heat-Treatment". (College of Technology, Sackville Street, Manchester, at 7.15 p.m.)

APPOINTMENTS VACANT

To conform to the requirements of the Control of Engagements Order, 1947, these advertisements are published for the information only of those who are "excepted persons" under the Order.

BRITISH NON-FERROUS METALS RESEARCH ASSOCIATION has a vacancy for a **METALLURGIST**. Applicants must be British and should possess a degree in metallurgy or have equivalent qualifications. The work entails the application of research results to industrial practice and in addition to technical qualifications requires a man with personality and tact. Some previous industrial experience would be an advantage. Salary commensurate with qualifications and experience. Reply to Secretary, British Non-Ferrous Metals Research Association, Euston Street, London, N.W.1.

BRITISH NON-FERROUS METALS RESEARCH ASSOCIATION has a vacancy for a **PHYSICIST** to work on spectrographic analysis of metals. Duties will include research on the direct recording of spectra using multiplier photo-cells and a detailed study of the discharge between metallic electrodes. Candidates should preferably have a good Honours degree in physics and research experience. Familiarity with spectrographic techniques would be an advantage. Commencing salary according to qualifications and experience. Apply to the Secretary, B.N.F.M.R.A., 81-91 Euston Street, London, N.W.1.

BRITISH NON-FERROUS METALS RESEARCH ASSOCIATION has a vacancy for a **RESEARCH ASSISTANT**, preferably A.R.I.C. standard, to work on the analysis of a wide range of non-ferrous alloys, including development of new analytical methods. Experience in polarographic methods would be an advantage but is not essential. Initial salary up to £500 per annum, depending on qualifications and experience. Apply to the Secretary, B.N.F.M.R.A., 81-91 Euston Street, London, N.W.1.

INTERNATIONAL METAL MERCHANTS in London with branches abroad offer important post to gentleman experienced in conducting negotiations on own initiative. Thorough knowledge export trade in non-ferrous metals, virgin, scrap, and semis essential. Write, giving full details of experience, age, and salary, in strictest confidence, to Box No. 288, Institute of Metals, 4 Grosvenor Gardens, London, S.W.1.

LABORATORY ASSISTANT experienced in ferrous and non-ferrous work analyses, knowledge of mechanical testing and metallography an advantage. Education to Inter B.Sc. standard. Write, giving details of age and experience, to Box No. 289, Institute of Metals, 4 Grosvenor Gardens, London, S.W.1.

METALLURGICAL CHEMIST: Well-established firm in the London area (Surbiton) is extending its capacity for the production of non-ferrous metals and castings and requires the services of a metallurgical chemist experienced in modern methods of industrial analysis. The laboratory is of recent construction and provides excellent working conditions. A permanent post with pension is offered to suitable applicant, who should write stating age, experience, and salary required to Box No. 287, Institute of Metals, 4 Grosvenor Gardens, London, S.W.1.

THE INSTITUTE OF METALS
4 GROSVENOR GARDENS, LONDON, S.W.1

Price List of Publications, from 1 December 1949

Note.—Prices quoted in U.S. dollars, for the convenience of American purchasers, include allowance for charges for collection of cheques. Customers' cheques on their American banks will be accepted.

INSTITUTE OF METALS	Published Price. Post Free		Reduced Price to Members (one copy each). Post Free		Booksellers' and Library Rate. Post Free	
	£	s. d.	\$	£	s. d.	\$
JOURNAL, 1909-1939, cloth-bound, per vol.	1	10 0	4.50	15 0	2.50	1 5 0
JOURNAL, annual, 1940-present date, cloth-bound, per vol.	3	0 0	9.00	1 10 0	4.50	2 10 0
METALLURGICAL ABSTRACTS, New Series, bound in cloth, annual, 1934 to present date, per vol.	3	0 0	9.00	1 10 0	4.50	2 10 0
MONTHLY JOURNAL AND METALLURGICAL ABSTRACTS, plus proceedings and index issues and binding cases, per annum	5	0 0	14.50	3 0 0	9.00	4 3 4
MONTHLY JOURNAL AND METALLURGICAL ABSTRACTS, per issue	7	6	1.50	3 9	1.00	6 3
GENERAL INDEXES (1909-1921), (1921-1938), bound in cloth, per vol.	1	0 0	3.00	10 0	2.00	16 8
PAPERS (back issues), per copy	2	6	0.75	1 3	0.50	2 1
<i>Monograph and Report Series</i>						
No. 1.—"The Structure of Metals and Alloys", by W. Hume-Rothery, seventh printing, revised (1950)	10	6	2.00	5 3	1.00	8 9
No. 2.—"Constitution of Alloys Bibliography", by J. L. Haughton (1942) (out of print)	...	...	...	...	...	...
Supplement No. 1 to ditto (1944)	9	0.50	5	0.30	7	0.
No. 3.—"Atomic Theory for Students of Metallurgy", by W. Hume-Rothery, third printing, revised (1948)	1	1 0	3.50	10 6	2.00	17 6
No. 4.—"An Introduction to the Electron Theory of Metals", by G. V. Raynor, second printing (1949)	10	6	2.00	5 3	1.00	8 9
No. 5.—"Symposium on Internal Stresses in Metals and Alloys" (1948)	2	2 0	6.00	1 1 0	3.50	1 15 0
No. 6.—"Symposium on Metallurgical Aspects of Non-Ferrous Metal Melting and Casting of Ingots for Working" (1949)	15	0	2.50	7 6	1.50	12 6
No. 7.—"The Solidification of Castings: A Review of the Literature", by R. W. Ruddle (1949)	10	6	2.00	5 3	1.00	8 9
No. 8.—"Symposium on Metallurgical Applications of the Electron Microscope" (volume in preparation)	...	...	...	...	...	...
<i>Annotated Equilibrium Diagram Series</i>						
No. 1 (Al-Zn); No. 2 (Cu-Sn); No. 3 (Cu-Zn); No. 4 (Al-Cu); No. 5 (Al-Mg); No. 6 (Pb-Sn); No. 7 (Be-Cu), each	2	0	0.50	1 0	0.40	1 8

DISCOUNT FOR SERIES

A discount of 10% on the above prices will be allowed on all orders of runs of 10 volumes or more and a special discount of 25% on the above prices will be allowed for complete sets of either the *Journal* or *Metallurgical Abstracts*.

NOTICE TO AUTHORS OF PAPERS

1. **Papers will be considered for publication from non-members as well as from members of the Institute.** They are accepted for publication in the *Journal*, and not necessarily for presentation at any meeting of the Institute, and should be addressed to The Editor of Publications, The Institute of Metals, 4 Grosvenor Gardens, London, S.W.1.
2. **Papers suitable for publication may be classified as :**
 - (a) Papers recording the results of original research ;
 - (b) First-class reviews of, or accounts of, progress in a particular field ;
 - (c) Papers descriptive of works methods, or recent developments in metallurgical plant and practice.
3. **Manuscripts and illustrations should be submitted in duplicate.** MSS. must be typewritten (*double-line spacing*) on one side of the paper only, and authors are required to sign a declaration that neither the paper nor a substantial part thereof has been published elsewhere. MSS. not accepted are normally returned within 3 months of receipt.
4. **Synopsis.** Every paper must have a synopsis which, in the case of results of research, should state its objects, the ground covered, and the nature of the results. The synopsis will appear at the beginning of the paper, and should be in a form suitable for use by abstracting organizations.
5. **References** must be collected at the end of the paper, and *each* must have a number. Initials of authors must be given, and the Institute's official abbreviations for periodical titles (as used in *Met. Abs.*) must be used where known. References must be set out in the style :

W. Rosenhain, *J. Inst. Metals*, 1923, **30**, 3 (i.e. year, volume, page).
6. **Illustrations.** Each illustration must have a number and description ; only one set of numbers must be used in one paper. The set of *line figures* sent for reproduction must be drawn in Indian ink on smooth white Bristol board, good-quality drawing paper, co-ordinate paper, or tracing cloth, which are preferred in the order given. Co-ordinate paper, if used, must be blue-lined with the co-ordinates to be reproduced *finely* drawn in Indian ink. All lettering and numerals, &c., should preferably be in *pencil*. Figures should be drawn approximately twice the size intended for reproduction. *Photographs* must be restricted in number, owing to the expense of reproduction, and trimmed to the smallest possible of the following sizes, consistent with adequate representation of the subject : 3 in. deep by 4 in. wide (two photomicrographs to a plate) ; 3 in. deep by 2½ in. wide (four to a plate) ; 2 in. deep by 2½ in. wide (six to a plate). Magnifications of photomicrographs must be given in each case. Photographs for reproduction should be loose, not pasted down (and not fastened together with a clip, which damages them), and the figure number should be written on the back of each. Legends should be given to photomicrographs, but lengthy descriptions should be avoided owing to the very limited space available on the plates. Illustrations that are not *essential* to the appreciation of the paper should not be included. Only in exceptional cases will illustrations be reproduced if already printed and readily available elsewhere.
7. **Tables or Diagrams.** Results of experiments, &c., may be given in the form of tables or figures, *but* (unless there are exceptional reasons) *not both*.
8. **Overseas Authors.** Authors resident in countries distant from Great Britain are requested to name, if possible, agents in Britain to whom may be referred matters concerning their papers, including proofs for correction. Translations from foreign languages should preferably be accompanied by a copy of the MS. in the language of the author.
9. **Offprints.** Individual authors are presented with 50, two authors with 70, and three with 90, offprints of their papers (in cover) from the *Journal*. Limited numbers of additional offprints can be supplied at the author's expense if ordered before proofs are passed for press. (Orders should preferably be placed when submitting the MSS.)
10. **Prizes for Papers.** Each year the following awards are made for papers published in the *Journal* : (a) Capper Pass Award for papers on processes or plant used in the fabrication of non-ferrous metals ; (b) W. H. A. Robertson Medal, and Premium for papers on engineering aspects of non-ferrous metallurgy.

THE INSTITUTE OF METALS

President :

Sir ARTHUR SMOUT, J.P.

Secretary :

Lieut.-Colonel S. C. GUILLAN, T.D.

Editor :

N. B. VAUGHAN, M.Sc., F.I.M.

Assistant Secretary :

Major R. E. MOORE

Administrative and Editorial Offices :

4 GROSVENOR GARDENS, LONDON, S.W.1

Telephone :

SLOANE 5928 & 6233

INSTITUTE NEWS AND ANNOUNCEMENTS

ANNUAL GENERAL MEETING, 29, 30, AND 31 MARCH 1950

The Annual General Meeting of the Institute will be held in London on Wednesday, Thursday, and Friday, 29, 30, and 31 March 1950, and it is hoped that there will be a large attendance.

Particular attention is directed to the following : (i) the induction of the new President, MR. H. S. TASKER, and his Presidential Address on the morning of Wednesday, 29 March, at the Café Royal; (ii) the luncheon following, at which the Institute of Metals Medal for 1950 will be presented; (iii) an all-day Symposium on "Metallurgical Aspects of the Hot-Working of Non-Ferrous Metals and Alloys", to be held in the Hall of the Institution of Mechanical Engineers on Thursday, 30 March; and (iv) a *Conversazione* on the evening of that day.

The Council has been anxious to provide suitable opportunities for members to meet each other, in appropriate circumstances, during this meeting, and hopes that the luncheon arranged for all members and their male guests and the *Conversazione* will achieve this end. The morning session of the meeting, held in another room at the Café Royal, will end at about noon, leaving members an hour during which they will be free to meet and talk before lunch is served at 1.0 p.m. The luncheon is regarded as a domestic affair, and there will be no speeches except those associated with the presentation of the 1950 Institute of Metals (Platinum) Medal to the distinguished French metallurgist, PROFESSOR ALBERT PORTEVIN. It is hoped that there will be a large attendance to do honour to Professor Portevin, who was elected an Honorary Member in 1940.

At the Symposium, DR. C. J. SMITHELLS, M.C., will act as rapporteur at the morning session, and MR. G. L. BAILEY, M.Sc., will be rapporteur in the afternoon. A free discussion is envisaged, at what is expected to be a very popular meeting. Invitations to speak are not being sent out on this occasion. A shorthand-writer will be present, but it is intended to publish in the *Journal* only a summarized version of the discussion. This being a public meeting, however, the Press may be present and may publish a report of the proceedings.

NEWS AND ANNOUNCEMENTS

PROGRAMME

Wednesday, 29 March

10.30 a.m.—*General Meeting at the Café Royal, Regent Street, London, W.1.*

Institute business.

Report of Council.

Report of the Honorary Treasurer.

Election of Officers for 1950-51.

Presentation of the first award of the W. H. A. Robertson Medal and Premium.

Induction of the new President, MR. H. S. TASKER, B.A. (Chairman of Goodlass Wall and Lead Industries, Ltd.).

Votes of thanks to the retiring President (SIR ARTHUR SMOUT, J.P.) and other officers.

Presidential Address, by MR. H. S. TASKER.

12.0 noon.—Adjournment. Drinks will be served in the reception room reserved for the Institute on the fourth floor.

1.0 p.m.—Luncheon, for members and male guests only. (Tickets price 18s., inclusive of coffee and gratuities.)

2.45 p.m.—Adjournment.

3.30 p.m.—*General Meeting at the Institution of Mechanical Engineers, Storey's Gate, Westminster, S.W.1.*

Discussion of papers :

SCHEUER : "Modern Billet Casting, with Special Reference to the Solidification Process" (No. 1211, Oct. 1949).

4.30 p.m.—Tea interval. (Tickets price 1s. 6d.)

5.0 p.m.—*Joint discussion of three papers* (Nos. 1220, 1221, and 1222, Dec. 1949).

EBORALL : "Grain Refinement of Aluminium and Its Alloys by Small Additions of Other Elements."

CIBULA : "The Mechanism of Grain Refinement of Sand Castings in Aluminium Alloys".

CIBULA and RUDDLE : "The Effect of Grain-Size on the Tensile Properties of High-Strength Cast Aluminium Alloys".

6.0 p.m.—Meeting adjourned.

Thursday, 30 March

10.0 a.m.—*General Meeting at the Institution of Mechanical Engineers, Storey's Gate, Westminster, S.W.1.*

Symposium on Metallurgical Aspects of the Hot Working of Non-Ferrous Metals and Alloys. (All papers published in the January, 1950, issue of the *Journal*.)

KASZ and VARLEY : "The Hot Rolling of Aluminium and its Alloys" (No. 1225).

SMITH : "The Extrusion of Aluminium Alloys" (No. 1226).

STOKELD : "The Hot Forging and Hot Stamping of Aluminium and its Alloys" (No. 1227).

WILKINSON and FOX : "The Hot Working of Magnesium and its Alloys" (No. 1228).

1.5 p.m.—*Buffet Lunch* (price 6s., for ticket holders only).

NEWS AND ANNOUNCEMENTS

2.30 p.m. *Symposium resumed.*

COOK and DAVIS: "The Hot Working of Copper and Copper Alloys" (No. 1229).

SHOWELL: "The Hot Working of Tin Bronzes" (No. 1230).

BACK: "The Hot Working of Lead and Lead-Rich Alloys" (No. 1231).

ROBERTS and WALTERS: "The Rolling of Zinc and Zinc-Rich Alloys" (No. 1232).

5.0 p.m.—Symposium concluded; General Meeting adjourned.

8.0 p.m.—*Conversazione and Exhibition of Books and Instruments at 4 Grosvenor Gardens, S.W.1.* (Tickets price 7s. 6d.)

Friday, 31 March

10.0 a.m.—*General Meeting at 4 Grosvenor Gardens, London, S.W.1.*
Discussion of papers:

OWEN and MORRIS: "The Application of X-Ray Methods to the Determination of Phase Boundaries in Metallurgical Equilibrium Diagrams" (No. 1213, Oct. 1949).

WOOD and RACHINGER: "The Mechanism of Deformation in Metals, with Special Reference to Creep" (No. 1217, Nov. 1949).

CAHN: "Recrystallization of Single Crystals after Plastic Bending" (No. 1212, Oct. 1949).

1.0 p.m.—The General Meeting will conclude.

Presentation of Papers and Subsequent Discussion

For an experimental period the Council has decided that during the discussion of papers (excepting Symposia) a shorthand-writer shall not be present, and it is hoped that more free and informal discussions will result. Speakers who consider that their remarks should be on record are invited to submit the main points of their contribution in writing, for publication with any correspondence received and the author's reply. As Institute meetings are public, the Press may be present and may publish a report of the discussion.

Members are requested particularly to note that, in order to provide as much time as possible for discussion, authors will be allowed a *maximum* of 5 minutes in which to introduce themselves to the meeting and to emphasize points on which they would particularly welcome discussion. It will be assumed that those present have read the papers to be presented.

Authors will be allowed *not less* than 10 minutes in which to reply to discussion.

Members intending to take part in the discussions on 29 and 31 March are requested to state their intention to do so as early as possible, and to say whether they desire to show lantern slides.

In the case of the Symposium, individual authors will *not* present their papers, and will not be called on to reply at the end of the discussion. They are invited to join in the General Discussion and to reply to points as they arise or when requested by the Chairman.

To obviate delays, those who have slides to show should hand them to the lantern operator, or a member of the Institute's staff, at the beginning of the session.

Attendance at the Meeting

Visitors will be welcome at all sessions of the General Meeting.

NEWS AND ANNOUNCEMENTS

HONORARY CORRESPONDING MEMBER TO THE COUNCIL

M. JEAN MATTER, Vice-Chairman and General Manager, Société Centrale des Alliages Légers, Issoire (Puy-de-Dôme), has accepted an invitation to serve as an additional Honorary Corresponding Member to the Council for France. He will share the responsibilities with Professor P. A. J. CHEVENARD, who has held the office since 1932, and to whom the Council is greatly indebted for his service and advice.

AUTUMN LECTURE 1950

DR. EARLE E. SCHUMACHER, Chief Metallurgist, Bell Telephone Laboratories Inc., Murry Hill, N.J., has accepted the Council's invitation to deliver the twenty-first Autumn Lecture during the meeting to be held in Bournemouth on 19-22 September 1950.

MONOGRAPH NO. 6—NON-FERROUS METAL MELTING AND CASTING OF INGOTS FOR WORKING

The sixth in the Institute's Monograph and Report Series has recently been published. It contains the six papers forming the Symposium on Metallurgical Aspects of Non-Ferrous Metal Melting and Casting of Ingots for Working, held during the Annual General Meeting last March, and the discussion upon them.

Both the papers and discussion have already been published in the *Journal* (the former in January, the latter in August 1949), but it was felt that many members and others would find it convenient to have the Symposium available separately from the *Journal*, and this reprint has accordingly been made and included in the Monograph Series.

The price is 15s. (\$2.50), post free, with one copy available to each member of the Institute at half price.

MONOGRAPH NO. 7—THE SOLIDIFICATION OF CASTINGS : A REVIEW OF THE LITERATURE

Monograph No. 7 has also been published recently. It contains a review of the literature on "The Solidification of Castings," prepared by Mr. R. W. RUDDLE of the British Non-Ferrous Metals Research Association. This review was originally submitted as a paper for the *Journal*, but on account of its length (116 pp.) it has been published in the Monograph Series. As was announced in a circular sent to members some weeks ago, one copy of this Monograph is available free to each member on request. The published price is 10s. 6d. (\$2.00), post free.

STUDENTS' TOUR, EASTER VACATION, 1950

An educational tour for Student Members and Associate Members will be held in the Sheffield area from Monday, 17 April to Friday, 21 April. Full particulars will be sent to all Student Members and Associate Members, who should advise the Secretary at the earliest possible moment if it is their intention or hope to take part. The tour held in Birmingham in 1949 was attended by nearly 100 students, and appeared to meet a real need felt by young men and women in industry as well as those studying at universities and technical colleges. On this occasion, the tour is open to university or technical college lecturers if present with their students.

NEWS AND ANNOUNCEMENTS

BINDING OF THE JOURNAL

It is found that many members when sending for binding the monthly issues of the *Journal* fail to send to the binder the special issues containing the indexes, title pages, &c., which are supplied to all members separately. These issues are essential to the binding of the volumes, and those for 1948 (for which binding cases have just been distributed) are labelled on the spine: "The Journal of the Institute of Metals, 1948, Vol. 74, Part 13 (Proceedings and Index Number)", and, "Metallurgical Abstracts, 1948, Vol. 15. Title Page, Contents, and Indexes".

BINDING CASES FOR 1945, 1946, AND 1947

The Institute has in stock a number of binding cases for the *Journal* and *Metallurgical Abstracts* for the years 1945, 1946, and 1947. Any members wishing to bind their publications for these years should apply to the Secretary for free cases.

DISCUSSION OF PAPERS

In order to assist the Committee responsible for arranging the programmes of the General Meetings of the Institute, will all members who are prepared to discuss orally any of the papers published in the *Journal* please inform the Secretary as soon as possible.

It is hoped that such information will enable programmes to be arranged which will secure well-attended and lively discussions.

ELECTION OF ORDINARY MEMBERS AND STUDENT MEMBERS

The following 27 members and 19 student members were elected on 9 February:

Ordinary Members

- CARLSSON, C. Georg, Metallurgical Engineer, Metallografiska Institutet, Drottning Kristinas väg 48, Stockholm, Sweden.
- CHANDARIA, Devchand P., Director and Manager, Kenya Aluminium and Industrial Works, Ltd., Rodgers Road, P.O. Box 341, Mombasa, Kenya.
- GARDNER, Robert Nathan Henry, B.Sc., Metallurgist, C. H. Parsons, Ltd., Britannia Works, Wharfedale Road, Tyseley, Birmingham.
- GOODWIN, Harold, Joint Managing Director, Birmetals, Ltd., Woodgate Works, Quinton, Birmingham 32.
- HENTZ, Åke G., Chief of the Metallurgical Laboratory, AB Luma-lamp, Lumavägen 6, Stockholm 20, Sweden.
- HUGHES, Charles Robert William, Senior Metallurgical Engineer, The Anglo-Argentine Iron Company, Ltd., Casilla de Correo 1627, Buenos Aires, Argentine.

NEWS AND ANNOUNCEMENTS

- KALLING, Professor Bo Michael Sture, Director of Research, Stora Kopparbergs Bergslags AB, Domnarvet, Sweden.
- KING, Ronald, B.Sc., Reader in Physics, University College, Gower Street, London, W.C.1.
- LAMOURDEDIEU, Marcel, Director, Société Centrale des Alliages Légers, 66 Rue de la Chaussée d'Antin, Paris, France.
- LIANDER, Nils Halvard, ASEA, Västerås, Sweden.
- LISSELL, Erik Olof, M.Sc., Gjuteriavdelningen, Sveriges Mekanförbund, Floragatan 5, Stockholm, Sweden.
- LORD, James Osborn, B.Chem.Eng., Associate Professor of Metallurgy, Ohio State University, Columbus 10, Ohio, U.S.A.
- MANTLE, Edward Charles, M.Sc., British Non-Ferrous Metals Research Association, Euston Street, London, N.W.1.
- MOCARSKI, Stanislaw, Dr.Ing., Metallurgist, David Brown Foundries Co., Ltd., Penistone, near Sheffield.
- MODIN, Sten Olof, Metallurgical Engineer, Metallografiska Institutet, Drottning Kristinas väg 48, Stockholm, Sweden.
- MOLINDER, Anders Göran, M.S., Chief Metallurgist; (mail): Box 68, Munkfors, Sweden.
- de NARDO, Juan Bautista, Professor of Physical Metallurgy, University of La Plata, La Plata, Argentine.
- OLT, Theodore F., Director, Research Division, Armco Steel Corporation, Middletown, Ohio, U.S.A.
- RAVEN, Richard Tebbitt, B.Sc., General Works Manager, Birmetals, Ltd., Woodgate Works, Quinton, Birmingham 32.
- SCHAUB, Cyril, Director of Research, Fagersta Bruks AB, Fagersta, Sweden.
- SPIEGELBERG, Arne Per Wilhelm, Metallografiska Institutet, Drottning Kristinas väg 48, Stockholm, Sweden.
- STEVENS, John Rupert, Head of Research Department, E. Silver and Co., 80 New Bond Street, London, W.1.
- STEWART, Max H., Chemist and Metallurgist, The Steel Improvement Co. Pty., Ltd., 102 Bay Road, North Sydney, Australia.
- WALLACE, Eben Richard, B.Sc., Chief Chemist, British Insulated Callender's Cables, Ltd., Prescott, Lancashire.
- WATKINS, Harry Clifford, Research Metallurgist, H. J. Enthoven and Sons, Ltd., 89 Upper Thames Street, London, E.C.4.
- WHITFIELD, John France, B.Sc., Chief Engineer, Birmetals, Ltd., Woodgate Works, Quinton, Birmingham 32.
- WHYMPER, Harry William, Foundry Manager, Birmetals, Ltd., Woodgate Works, Quinton, Birmingham 32.

Student Members

- BECKER, Jean, Metallurgist; (mail): 20 rue de Passy, Paris XVIe, France.
- CHAUDHURI, Arup Ratan, B.Sc., Research Student, University of Manchester.
- COOPER, Norman, Student of Metallurgy, Royal Aircraft Establishment, Farnborough, Hants.
- DAVIES, Brian Gowan, Post-graduate Student of Metallurgy, University College, Cardiff.
- DENNIS, Thomas John, Student of Metallurgy, University of Birmingham.
- FAULKNER, Charles Raymond, B.Sc., Research Student, University of Birmingham.

NEWS AND ANNOUNCEMENTS

- HARRIS, Solomon Wilfred, Student of Metallurgy, Royal Technical College, Glasgow.
- JACKSON, William James, Student of Metallurgy, University of Birmingham.
- KULA, Eric Bertil, S.B., Research Assistant, Institut fur Metallografi, Royal Institute of Technology, Stockholm 26, Sweden.
- KUO, Ke-hsin, B.Sc., Research Assistant, Royal Institute of Technology, Stockholm 26, Sweden.
- LLOYD, Raymond Charles, Assistant Metallurgist, James Booth and Co., Ltd., Argyle Street, Nechells, Birmingham 7.
- MARSHALL, J. B., Assistant Metallurgist, English Electric Co., Ltd., Preston, Lancashire.
- NYGREN, Erik, Metallurgist; (mail): Box 68, Munkfors, Sweden.
- SHAKESPEARE, William George, Student of Metallurgy, University of Birmingham.
- SMALLMAN, Raymond Edward, Student of Metallurgy, University of Birmingham.
- SWANSON, Colin John, B.Sc., Research Bursar, British Non-Ferrous Metals Research Association, Euston Street, London, N.W.1.
- TAYLOR, Alan Frederick, Student of Metallurgy, University of Birmingham.
- VAUGHAN, Charles Stanley, Assistant Metallurgist, Cannon Iron Foundries, Ltd., Deepfields, near Bilton, Staffordshire.
- WHITWHAM, Donald, M.A., Research Student, Laboratoire du Centre Nationale de la Recherche Scientifique, Paris, France.

PERSONAL NOTES

MR. P. T. ARTHUR has been awarded the degree of Ph.D. of Glasgow University.

MR. V. AYTEKIN has been awarded the degree of Ph.D. of Birmingham University and has returned to Turkey.

MR. B. A. BILBY has been awarded the Ph.D. degree of Birmingham University.

MR. S. BINNER is now on the headquarters staff of the Training Dept. of Messrs. Stewarts and Lloyds, Ltd., Corby, Northants.

MR. PER O. BJORKMAN has left ASEA, Västerås, and has taken up an appointment with Enköpings Verkstäder, Enköping, Sweden.

MR. F. C. BRABY has been elected Vice-Chairman and Treasurer of the British Non-Ferrous Metals Research Association, in succession to the Hon. R. M. Preston.

MR. G. J. BRITTINGHAM has resigned his position as General Superintendent of the Electrolytic Refining and Smelting Co. of Australia Pty., Ltd., and is now in practice as a consulting metallurgist. His address is 28 Eastern Avenue, Mangerton, Wollongong, N.S.W., Australia.

MR. J. GRAY BUCHANAN, Chairman of Messrs. William Jacks and Co., Ltd., and the oldest member of the London Metal Exchange, was recently presented by his co-directors and staff with a portrait in oils, on the occasion of his 80th birthday.

NEWS AND ANNOUNCEMENTS

MR. B. R. BUTCHER has left Birmingham University and is now in the Metallurgy Division, Atomic Energy Research Establishment, Harwell, Berks.

MR. R. W. CAHN has recently been awarded the Ph.D. degree of Cambridge University. He published a paper in the October issue of the *Journal* entitled "Recrystallization of Single Crystals after Plastic Bending".

DR. MAURICE COOK has been elected Chairman of the Research Board of the British Non-Ferrous Metals Research Association, in succession to Professor A. J. Murphy.

MR. MORGAN H. DAVIES has left the A.E.I. Research Laboratories, Aldermaston, in order to take up an E.C.A. Scholarship at the Carnegie Institute of Technology, Pittsburgh, Pa.

MR. HOWELL T. EVANS is now engaged in the Research Laboratories of the Deloro Smelting and Refining Co., Ltd., Deloro, Ont., Canada.

PROFESSOR D. HANSON, of Birmingham University, was one of the British representatives who discussed the further release of information on atomic research with Americans and Canadians at Harwell recently.

MR. J. B. HAWORTH has left the Inorganic Chemistry Laboratory, Oxford, where he has been working with Dr. Hume-Rothery, and is now Research Metallurgist with Murex, Ltd., Rainham, Essex.

MR. D. E. R. HUGHES, of the Department of Development and Research, Tube Investments, Ltd., has recently been awarded the degree of Ph.D. (Metallurgy) of the University of Birmingham.

MR. DAVID HUMPHREYS has left the Royal School of Mines and is now in the Technical Department of the Northern Aluminium Co., Ltd., Banbury.

MR. J. F. B. JACKSON has been appointed Director of Research to the recently formed Research and Development Division of the British Steel Founders' Association. He was previously Chief Metallurgist and Technical Controller (Foundries) to David Brown and Sons (Huddersfield), Ltd. When the Research and Development Division of the B.S.F.A. was formed last year, it was stated that one of its main purposes was to bridge the gap between scientific knowledge and steel foundry practice for the improvement of production technique, raising the quality of the product, and reducing manufacturing costs.

DR. ZAY JEFFRIES, Vice-President of the General Electric Company in charge of the Chemical Department, retired from the Company on 31 December 1949.

DR. IRVING LANGMUIR has retired from the General Electric Company, Schenectady, N.Y., where he has served as Associate Director of the Research Laboratory since 1932. He will continue work in the laboratory as a consultant. Dr. Langmuir is a Nobel prizeman, and was elected an Honorary Member of the Institute of Metals in 1943.

MRS. JUNE A. McNICOL is a Junior Research Fellow in the University of Queensland, Brisbane.

MR. R. MELLOR, formerly Works Manager to the Star Aluminium Co., Ltd., Wolverhampton, is now Chief Engineer, South Wales Aluminium Co., Ltd., Resolven, Glam.

NEWS AND ANNOUNCEMENTS

MR. J. F. MILLS has recently taken up a post in the Engineering Department of Imperial Chemical Industries, Ltd., Metals Division, Witton, Birmingham.

PROFESSOR H. O'NEILL has been awarded a Nuffield Travelling Fellowship and expects to be in Canada and the United States during July, August, and September.

THE HON. R. M. PRESTON has been elected Chairman of Council of the British Non-Ferrous Metals Research Association, in succession to Lieut.-Colonel Sir John Greenly. Mr. Preston was President of the Institute in 1940-42 and received the Platinum Medal in 1944.

MR. H. G. PYKE has been elected President of the New South Wales Branch of the Royal Australian Chemical Institute for 1949-50.

DR. C. J. SMITHELLS has been elected Chairman of the Aluminium and Magnesium Industry Committee of the B.N.F.M.R.A., in succession to Dr. Maurice Cook.

MR. RICHARD TURNER has been appointed Managing Director of Mallory Metallurgical Products, Ltd.

MR. L. E. VOGEL has recently received the degree of Ph.D. of Birmingham University. He has left the A.D.A. Welding Research Team.

DR. M. B. WALDRON is now engaged on research into alloy systems at the Atomic Energy Research Establishment, Harwell, Berks.

DEATHS

The Editor regrets to announce the deaths of:

MR. FRANK ARTHUR ALLEN, director of Bronze Smelters, Ltd., Cardiff, on 18 January in his 43rd year. Before joining Bronze Smelters, Ltd., a year or so ago, Mr. Allen was for some time with Magnal Products, Ltd., of Bristol, first as chief metallurgist and later as works manager. In 1942 he was one of a team sent to the United States to advise on light alloy casting production.

MR. A. GLYNNE LOBLEY, M.Sc., A.M.I.E.E., on 16 January at the age of 62. Mr. Lobley, who was born at Hanley, Stoke-on-Trent, was educated at Newcastle-under-Lyme High School and the Victoria University, Manchester. For some years he lectured at Manchester and Sheffield Universities in electrometallurgy, and afterwards founded Birmingham Electric Furnaces, Ltd., now well known as Birlec, Ltd., of which Mr. Lobley was Managing Director at the time of his death. He had been a member of the Institute since 1920, and served on its Publication Committee during the last year.

MARRIAGE

The marriage of Lieut.-Colonel S. C. GUILLAN, Secretary of the Institute of Metals, and Miss NETTA LUCILLA VARLEY, lately of Sheestown, Co. Kilkenny, took place quietly in London on Thursday, 2 February.

NEWS OF LOCAL SECTIONS AND ASSOCIATED SOCIETIES

LONDON LOCAL SECTION

At a meeting of the Section held on 5 January at 4 Grosvenor Gardens, London, S.W.1, Mr. L. A. J. LODDER gave a lecture entitled

Zinc Casting Alloys : Their Development and Uses

In the course of his remarks, the lecturer compared British and American consumption of zinc by major uses and drew attention to the larger American usage of zinc pressure-die-casting alloys. He then traced the development of pressure die-casting and of the zinc alloys, describing how the disadvantages of the earlier alloys were overcome progressively as a result of the efforts of American research workers.

He dealt with the constitution of the two zinc pressure-die-casting alloys conforming to B.S. 1004 and surveyed their mechanical properties in relation to characteristics of design. The mechanism of intercrystalline corrosion was then discussed in order to emphasize the care necessary to exclude the harmful contaminants lead, cadmium, and tin.

Limits of size and weight of commercial castings were quoted, with examples of the high rates of production attainable. Major outlets for zinc alloy die-castings were considered briefly by industries.

The war-time development and the uses of cast zinc alloy press tools were then considered, together with Continental applications of zinc alloys in pressure and gravity die-castings and sand castings. Attention was directed to the immense use which the Germans made of zinc alloys during the war years as substitutes for brass in order to conserve copper.

The lecture was illustrated by lantern slides and by specimens.

JOINT ACTIVITIES

MOND NICKEL FELLOWSHIPS 1949

The Mond Nickel Fellowships Committee have pleasure in announcing the following further award for 1949 :

Mr. E. BRUNSKILL (Mufulira Copper Mines, Ltd.) to study the metallurgical practice in the mining, smelting, and refining of non-ferrous metals in Africa, with special reference to copper and related metals.

MOND NICKEL FELLOWSHIPS 1950

The Mond Nickel Fellowships Committee invites applications for the award of Mond Nickel Fellowships for the year 1950. Awards will be made to selected applicants of British nationality educated to University degree or similar standard, though not necessarily qualified in metallurgy, who wish to undergo a programme of training in industrial establishments. They will

NEWS AND ANNOUNCEMENTS

normally take the form of travelling Fellowships, but awards for training at universities may be made in special circumstances. There are no age limits, though awards will seldom be given to persons over 35 years of age. Each Fellowship will occupy one full working year. The Committee hope to award up to five Fellowships each year of an average value of £750 each.

Mond Nickel Fellowships will be awarded in furtherance of the following objects :

- (a) To allow selected persons to pursue such training as will make them better capable of applying the results of research to the problems and processes of the British metallurgical and metal-using industries.
- (b) To increase the number of persons who, if they are subsequently employed in executive and administrative positions in the British metallurgical and metal-using industries, will be competent to appreciate the technological significance of research and its results.
- (c) To assist persons with qualifications in metallurgy to obtain additional training helpful in enabling them ultimately to assume executive and administrative positions in British metallurgical and metal-using industries.
- (d) To provide training facilities whereby persons qualified in sciences other than metallurgy may be attracted into the metallurgical field and may help to alleviate the shortage of qualified metallurgists available to industry.

Applicants will be required to state the programme of training in respect of which they are applying for an award, as well as particulars of their education, qualifications, and previous career. Full particulars and forms of application can be obtained from: The Secretary, The Mond Nickel Fellowships Committee, 4 Grosvenor Gardens, London, S.W.1. Completed application forms will be required to reach the Secretary of the Committee not later than 1 June 1950.

OTHER NEWS

THE INSTITUTION OF METALLURGISTS

The following were elected to the various grades of membership on 27 October 1949 :

As Fellows

DEERING, Ernest Charles, B.Sc., F.R.I.C. (Johnson, Matthey & Co., Ltd.).

FOWLER, William Arthur, A.Met. (The British Aluminium Co., Ltd.).

OROWAN, Egon, Dr.Ing., M.A. (Cambridge University).

STANLEY, Herbert Howard, A.Met. (Steel Co. of Wales (Lysaght Works), Ltd.).

TRASH, Arthur Willie (H. J. Enthoven & Sons, Ltd.).

As Fellow from Grade of Associate

HOPKINS, Donald Walter, M.Sc. (University College, Swansea).

NEWS AND ANNOUNCEMENTS

As Associates

- CANN, Harold (Public Works Dept., Birmingham).
DUNNING, Joseph, A.M.C.T. (Rotherham Technical College).
GREENWOOD, Arthur, A.Met. (Fairey Aviation Co., Ltd.).
GREGORY, James Clifford, A.Met. (Imperial Chemical Industries, Ltd., General Chemicals Division).
HARRINGTON, John Frederick, B.Sc., A.R.S.M. (Southbury Smelting Works, Ltd.).
HENLEY, Vernon Frederick Frank, B.Sc., F.R.I.C. (W. Canning & Co., Ltd.).
IYER, Venkatasubba Rama, B.Sc. (Bhartia Electric Steel Co., Ltd.).
LINDLEY, Noel (A.I.D., Metallurgical Inspector).
POUNDER, Aubrey John (Wolsingham Steel Co., Ltd.).
RITCHIE, John Gowar, B.Met.E. (McPherson's, Ltd. (Melbourne)).
SACHS, Kurt, B.Sc. (The Mond Nickel Co., Ltd.).
SALLIS, William Arthur, A.Met. (The Chesterfield Tube Co., Ltd.).
SCHENKEL, John Robert Harry, A.R.I.C., A.C.T.C. (Charles Clifford & Son, Ltd.).
SIVYER, Harold Henry (The Anti-Attrition Metal Co., Ltd.).
STEVEN, William, Ph.D., B.Sc. (The Mond Nickel Co., Ltd.).
TUCKER, Anthony John Philip, M.A., Ph.D. (Imperial Chemical Industries, Ltd., Billingham Division).
TYRER, Joseph, B.Sc. (Manganese Bronze & Brass Co., Ltd.).
VENKATRATHNAM, Krovvidi, B.Sc., M.Sc., M.Sc.Tech. (Hyderabad Government Scholar).
WING, Peter Denniff, A.Met. (Sheepbridge Engineering, Ltd.).

As Associates from Grade of Licentiate

- DIXON, Geoffrey Walter, A.Met. (William Jessop & Sons, Ltd.)
GOMM, Stanley, A.Met. (Darwins, Ltd.).
MERCER, Jeffrey Francis (United Metal Electrodes & Welding Equipment, Ltd.).
NORTHWOOD, James Edward, B.Sc. (Ministry of Supply, National Gas Turbine Establishment).

As Licentiates

- HARRIS, Ian Robert (Colvilles, Ltd.).
LAHIRI, Sudhansu Kumar, B.Eng. (Government of India, Metallurgical Inspectorate).
RAMA CHAR, Tirumale Lakshminarasimhacher, B.Sc., M.Sc., Ph.D. (Indian Institute of Science).
RIDOUT, Philip James (Metals and Plastic Compacts, Ltd.).
SMITH, Kenneth Wolstenholme (Humber, Ltd.).

FOURTH WORLD POWER CONFERENCE

The Fourth World Power Conference will be held in London from Monday, 10 July, to Saturday, 15 July 1950. This is the first Plenary Meeting of the World Power Conference since the Conference held in Washington, U.S.A., in 1936. The Theme of the Conference is "World Energy Resources and the Production of Power". The Technical Programme, which contains fuller particulars of the subjects dealt with, may be obtained from the respective National Committees or Representatives of the World Power Conference or from the General Secretary at the address given below.

NEWS AND ANNOUNCEMENTS

A number of tours in the United Kingdom, each lasting about a week, has been arranged for the week beginning Monday, 17 July 1950. Opportunity has been taken in arranging the itineraries for the inspection of technical installations to include visits to places of historical interest and scenic beauty. For those not wishing to join one of these tours there will be day and half-day excursions from London. Particulars will be found in the provisional programme, which, together with forms of application for membership of the Conference, for travel and hotel reservations, and for participation in the tours and excursions, is now available from The Conference Offices, Fourth World Power Conference, 414 Cecil Chambers, 76/86 Strand, London, W.C.2 (TEMPle Bar, 1234, Ext. 473).

CONGRES DU GROUPEMENT POUR L'AVANCEMENT DES METHODES SPECTROGRAPHIQUES

The 13th Congress of the Groupement pour l'Avancement des Méthodes Spectrographiques will be held on 21-23 June 1950 at the Laboratoire Central de l'Armement, 1 Place St. Thomas d'Aquin, Paris, 7^e. Four technical sessions are planned, with a visit to a works or laboratory on the afternoon of the 22nd. Anyone wishing to submit a communication to the Congress should send two copies of the typescript and illustrations to the Secrétaire du G.A.M.S., at the above address.

MATERIALS OF CONSTRUCTION FOR THE CHEMICAL INDUSTRY

The Society of Chemical Industry is organizing a Conference on "Materials of Construction for the Chemical Industry", to be held at the University, Edgbaston, Birmingham 15, on 18-20 April 1950. Six sessions have been provisionally arranged, the fourth of which, under the chairmanship of Dr. C. H. DESCH, will be devoted to the non-ferrous metals. At this session it is hoped that the following papers will be presented: "Uses of Aluminium", by Mr. G. A. DUMMETT; "Lead as a Material of Construction", by Mr. ARNOLD LLOYD; "The Uses of Tin in the Chemical Industries", by Dr. E. S. HEDGES; "Copper and Copper Alloys for Chemical Plant", by Dr. MAURICE COOK; and "Noble Metals", by Dr. J. M. PIRIE.

The Conference fee will be 10s. for members of the Society and £2 for non-members, including in each case copies of all papers preprinted. Applications for membership of the Conference should be addressed to the General Secretary of the Society of Chemical Industry, 56 Victoria Street, London, S.W.1, from whom further details of the Conference may be obtained.

JOINT A.S.T.M.-A.S.M.E. COMMITTEE ON EFFECT OF TEMPERATURE ON METALS

In order more effectively to carry out its various activities, the Joint Committee on Effect of Temperature on the Properties of Metals, which functions under the auspices of the American Society for Testing Materials and the American Society of Mechanical Engineers, has virtually completed re-organization of its sub-committees and personnel. This group, always very active in sponsoring technical papers and symposia, has several papers

NEWS AND ANNOUNCEMENTS

and reports under way, including two symposia, one covering "The Effect of Sigma Phase on the Properties of Metals at Elevated Temperatures", the other dealing with "The Corrosion of Gas Turbine Materials". These symposia will each include eight to ten papers, and are scheduled for presentation at the A.S.T.M. Annual Meeting in Atlantic City during the week beginning 26 June 1950.

THE ELECTROCHEMICAL SOCIETY

The annual meeting of the Electrochemical Society is to be held in Cleveland, Ohio, at the Hotel Statler, on 19-22 April 1950. Symposia are now being planned on the following subjects: Theoretical Electrochemistry, Rare Metals, Instrumentation, Electrothermics, Luminescence, Industrial Electrolytics, and Electric Insulation.

INTERNATIONAL UNION OF CRYSTALLOGRAPHY

The Executive Committee has accepted a kind invitation from the Swedish National Committee of Crystallography to hold the Second General Assembly and International Congress in Stockholm from 27 June to 3 July 1951. These dates have been chosen in consultation with the Swedish National Committee and with the National Committees of all the Adhering Bodies. It is hoped that this early notice will make it possible for crystallographers throughout the world to arrange to attend.

CONFERENCE ON THE PROPERTIES OF SEMI-CONDUCTING MATERIALS

A Conference on the Properties of Semi-Conducting Materials will take place at the University of Reading from 10 to 15 July 1950, under the auspices of the International Union of Physics, in co-operation with the Royal Society. Leading research workers from Czechoslovakia, France, Netherlands, Sweden, Switzerland, the U.S.A., and Great Britain will contribute papers, the subjects of which include the conductive properties of non-metallic solids, photo-conduction, barrier layer rectifiers, crystal triodes, &c., and the relevant theoretical issues. The Proceedings of the Conference will be published in book form. A General Prospectus can be obtained from the Secretary, Dr. H. K. Henisch, Department of Physics, The University, Reading.

6TH INTERNATIONAL CONGRESS OF RADIOLOGY, 1950

The 6th International Congress of Radiology will be held on 23-29 July 1950, at the Central Hall, Westminster. Full details may be obtained from the Secretary-General at 45 Lincoln's Inn Fields, London, W.C.2.

ALUMINIUM BERATUNGSSTELLE

The Aluminium-Beratungsstelle E.V., an association of German aluminium firms, has been set up at Grevenbroich/Ndrh. (British Zone) to advise users on the applications, &c., of aluminium and its alloys. Its first publication, "Aluminium im Verkehrswesen", has been received in this country and will be abstracted in *Metalurgical Abstracts* next month.

DIARY FOR MARCH

INSTITUTE MEETING

Annual General Meeting.—Wednesday, Thursday, and Friday, 29, 30, and 31 March. For details, see p. 77.

LOCAL SECTIONS MEETINGS

THURSDAY, 2 MARCH

Birmingham Local Section.—A. V. Hooker and A. J. K. Honeyman open discussion on "Some Modern Aspects of Welding". (James Watt Memorial Institute, Great Charles St., Birmingham 3, at 6.30 p.m.)

THURSDAY, 9 MARCH

London Local Section.—R. J. L. Eborall: "Recrystallization". (4 Grosvenor Gardens, London, S.W.1, at 7 p.m.)

FRIDAY, 10 MARCH

Birmingham Local Section.—All-Day Symposium on "The Investigation of Alloy Systems". (Chamber of Commerce, New Street, Birmingham.)

MONDAY, 13 MARCH

Scottish Local Section.—Annual General Meeting. G. H. Botham: "Uses of Non-Ferrous Metals in the Chemical and Food Industry". (39 Elmbank Crescent, Glasgow, C.2, at 6.30 p.m.)

TUESDAY, 14 MARCH

South Wales Local Section.—F. C. Ashen: "Fuel Utilization in the Non-Ferrous Industry". (University College, Metallurgical Department, Singleton Park, Swansea, at 6.30 p.m.)

THURSDAY, 23 MARCH

Birmingham Local Section.—M. M. Hallett: "Modern Cast Irons". (James Watt Memorial Institute, Great Charles St., Birmingham 3, at 6.30 p.m.)

THURSDAY, 30 MARCH

Sheffield Local Section.—Annual General Meeting. Films. (Grand Hotel, Sheffield, at 6.30 p.m.)

OTHER MEETINGS

WEDNESDAY, 1 MARCH

Institution of Production Engineers, Preston Section.—C. S. Johnson: "Modern Foundry Practice". (Harris Institute, Corporation St., Preston, at 7.15 p.m.)

Manchester Metallurgical Society.—Dr. J. W. Cuthbertson: "Continuous Casting of Metals". Followed by Annual General Meeting. (Engineers' Club, Albert Square, Manchester, at 6.30 p.m.)

NEWS AND ANNOUNCEMENTS

THURSDAY, 2 MARCH

Leeds Metallurgical Society.—T. S. Davies presents film on "Modern Chain Making". (Chemistry Department, The University, Leeds 2, at 7 p.m.)

Liverpool Metallurgical Society.—Dr. J. C. Hudson: "Corrosion of Iron and Steel". (Liverpool Engineering Society's Rooms, 9 The Temple, 24 Dale St., Liverpool, at 7 p.m.)

West of Scotland Iron and Steel Institute.—A. I. Nussbaum: "Review of Recent American Rolling Mill Installations". Joint Meeting with Iron and Steel Engineers' Group. (39 Elmbank Crescent, Glasgow, C.2, at 6.45 p.m.)

TUESDAY, 7 MARCH

Electrodepositors' Technical Society, Midlands Centre.—G. H. Hands: "Experiences in Bright Nickel Plating". (James Watt Memorial Institute, Great Charles St., Birmingham 3, at 6.30 p.m.)

University of Birmingham Metallurgical Society.—Sir Lawrence Bragg: "The Bubble Model of a Metal Structure". (Metallurgy Dept., The University, Birmingham 15, at 4 p.m.)

MONDAY, 13 MARCH

Institution of Structural Engineers, Scottish Branch.—J. L. Wynne: "Protection of Steelwork Against Corrosion". (39 Elmbank Crescent, Glasgow, C.2, at 6.15 p.m.)

TUESDAY, 14 MARCH

Institution of Production Engineers, Birmingham Graduate Section.—J. L. Williams: "Production Methods for Medium-Sized Presswork". (James Watt Memorial Institute, Great Charles St., Birmingham 3, at 7 p.m.)

WEDNESDAY, 15 MARCH

Institute of Fuel, Yorkshire Section.—A. E. Dodd: "Recent Developments in High-Temperature Refractories". (The University, Leeds, at 2.30 p.m.)

Institute of Welding, West of Scotland Branch.—E. S. Semper: "Some Suggestions for More Efficient Oxygen Cutting". (39 Elmbank Crescent, Glasgow, C.2, at 7 p.m.)

Institution of Heating and Ventilating Engineers, South-Western Branch.—G. E. C. Coates: "Corrosion of Metals". (R.W.A. School of Architecture, Bristol, at 6.30 p.m.)

Institution of Production Engineers, Birmingham Section.—J. Sharman: "Modern Forging Practice". (James Watt Memorial Institute, Great Charles St., Birmingham 3, at 7 p.m.)

Institution of Production Engineers, Liverpool Section.—T. A. Evans: "Methods of Protection Against Metallic Corrosion". (Radiant House, Bold St., Liverpool, at 7.15 p.m.)

Institution of Production Engineers, Manchester Section.—J. McHenry: "Advance in Industrial Heat-Treatment". (Mechanics' Institute, Crewe, at 7.15 p.m.)

NEWS AND ANNOUNCEMENTS

Manchester Metallurgical Society.—Dr. U. R. Evans: "Modern Views of the Corrosion of Metals". Joint Meeting with the Institute of Metals. (Engineers' Club, Albert Square, Manchester, at 6.30 p.m.)

THURSDAY, 16 MARCH

Institution of Mining and Metallurgy.—Dr. W. M. Evans: "The Hollow-Charge Effect"; N. Hedley: "Polyphosphates in Cyanidation". (Geological Society of London, Burlington House, Piccadilly, W.1, at 5 p.m.)

Institution of Production Engineers, Manchester Graduate Section.—P. G. Bell: "The Manufacture and Use of Tungsten Carbides". (Reynolds Hall, College of Technology, Manchester, at 7.15 p.m.)

FRIDAY, 17 MARCH

Chemical Society.—Professor E. K. Rideal: "How Crystals Grow". (Chemistry Dept., The University, Birmingham 15, at 4.30 p.m.)

Institution of Production Engineers, North-Eastern Graduate Section.—R. B. Williams: "Welding". (Neville Hall, Mining Institution, Westgate Rd., Newcastle-upon-Tyne 1, at 7 p.m.)

West of Scotland Iron and Steel Institute.—J. M. Mowat: "Special Steel for Special Purposes". (39 Elmbank Crescent, Glasgow, C.2, at 6.45 p.m.)

SATURDAY, 18 MARCH

Swansea and District Metallurgical Society.—R. W. Evans: "The Manufacture of Deep-Drawing Steel". (Central Library, Swansea, at 6.30 p.m.)

MONDAY, 20 MARCH

Electrodepositors' Technical Society, London Centre.—Discussion on "Recent Developments in Bright Nickel Plating". (Northampton Polytechnic, London, E.C.1, at 5.30 p.m.)

TUESDAY, 21 MARCH

Institution of Engineers and Shipbuilders in Scotland.—G. R. Grange and L. Blake: "Some Notes on 'Scuffing' of Teeth in Marine Gears". (39 Elmbank Crescent, Glasgow, C.2, at 6.30 p.m.)

THURSDAY, 23 MARCH

Institution of Production Engineers, London Section.—Dr. R. Genders: "The Effective Selection and Use of Materials". (Royal Empire Society, Northumberland Avenue, London, W.C.2, at 6.30 p.m.)

FRIDAY, 24 MARCH

Electrodepositors' Technical Society, Sheffield and North-East Centre.—A. W. Hothersall: "Structure of Electrodeposited Metals". (Grand Hotel, Sheffield, at 6.30 p.m.)

Society of Instrument Technology, Scottish Section.—J. Harbinson: "Instrumentation and Control of Reheating Furnaces". (Royal Technical College, George Street, Glasgow, C.1, at 7 p.m.)

NEWS AND ANNOUNCEMENTS

WEDNESDAY, 29 MARCH

Institution of Production Engineers, Shrewsbury Sub-Section.—"Sand Casting". (Walker Technical College, Oakengates, at 7.30 p.m.)

THURSDAY, 30 MARCH

Leeds Metallurgical Society.—A Member of the Research Staff of the British Cast-Iron Research Association: "Nodular Cast Iron". (Chemistry Department, The University, Leeds 2, at 7 p.m.)

Liverpool Metallurgical Society.—Annual General Meeting. Professor C. O. Bannister: "The Metallurgical Patents of Alexander Parks". (Liverpool Engineering Society's Rooms, 9 The Temple, 24 Dale St., Liverpool, at 7 p.m.)

Royal Institute of Chemistry, London and South-Eastern Counties Branch.—Dr. W. D. Jones: "The Production of Heat-Resisting Materials by Powder Metallurgy". (Philips Electrical, Ltd., New Rd., Mitcham Junction, at 7.15 p.m.)

APPOINTMENTS VACANT

To conform to the requirements of the Control of Engagements Order, 1947, these advertisements are published for the information only of those who are "excepted persons" under the Order.

APPLICATIONS are invited from fully qualified CHEMISTS for an interesting progressive position in a rapidly expanding organization in the Midlands.

Applicants must have a degree or equivalent qualification and will be required to undertake a wide variety of work, including investigations on metal finishing, oils, greases, corrosion, &c.

Full particulars, including present salary, should be sent to Box No. 290, Institute of Metals, 4 Grosvenor Gardens, London, S.W.1.

CHAIR OF METALLURGY, NEW SOUTH WALES UNIVERSITY OF TECHNOLOGY. Applications are invited for appointment to the foundation Chair of Metallurgy in the New South Wales University of Technology. Applicants should possess an advanced degree (preferably with honours) in metallurgy or in an allied field, and should be distinguished by their work in industrial research.

Salary will be £1500 (Australian) per annum. The appointee will be eligible, subject to medical examination, to contribute to the Superannuation Fund, which will provide an annual pension of up to £812 (Australian) per annum.

Further particulars may be obtained from the Agent General for New South Wales, 56 Strand, London, W.C.2, with whom applications should be lodged by the 1 April 1950.

METALLURGISTS. The Imperial Smelting Corporation requires Technical Assistants for plant investigations of a metallurgical nature. Must have degree or equivalent qualification. Experience on non-ferrous plant work an advantage, but not essential. Opportunities for promotion good. Salary in accordance with qualifications and experience. Apply in writing to Manager, Personnel Department, Imperial Smelting Corporation, Avonmouth, Bristol, quoting ref. IM/TA.

RESEARCH ENGINEER, PHYSICIST, or METALLURGIST wanted to take charge of Mechanical Testing Section, including creep and fatigue laboratory, and to carry out research on engineering problems. Work will be mainly, but not solely, concerned with metallic materials. Engineer preferred, but Physicist or Metallurgist with previous experience of creep and fatigue testing would be considered. University degree (1st or 2nd class honours) or equivalent qualification required. Salary £750-£1000, according to qualification and experience. Apply in writing to The Fulmer Research Institute, Stoke Poges, Bucks.

YOUNG EXECUTIVE to develop chill-cast bronze and assist in production, Midlands area. Theoretical and practical knowledge of tin bronze metallurgy essential. A.R.S.M. preferred, but lack of academic qualifications would not preclude. Prospects excellent. Commensurate salary. Pension fund. Write in strictest confidence to Box D. 505, Willings, 362 Gray's Inn Road, London, W.C.1.

THE INSTITUTE OF METALS

President :

Sir ARTHUR SMOUT, J.P.

Secretary :

Lieut.-Colonel S. C. GUILLAN, T.D.

Editor :

N. B. VAUGHAN, M.Sc., F.I.M.

Assistant Secretary :

Major R. E. MOORE

Administrative and Editorial Offices :

4 GROSVENOR GARDENS, LONDON, S.W.1

Telephone :

SLOANE 5928 & 6233

INSTITUTE NEWS AND ANNOUNCEMENTS

HONORARY MEMBER OF COUNCIL

Major-General S. W. JOSLIN, M.B.E., has succeeded Major-General W. S. TOPE, C.B., C.B.E., as an Honorary Member of Council, representing the War Office.

HONORARY CORRESPONDING MEMBERS TO THE COUNCIL

The Council has accepted, with much regret, the resignation of Dr. O. W. ELLIS as Honorary Corresponding Member to the Council for Canada, and has appointed, in his place, Professor BRUCE CHALMERS, of the University of Toronto, and Professor G. LETENDRE, of Laval University, Quebec, who will hold the office jointly.

WALTER ROSENHAIN MEDAL

The Council has most gratefully accepted an offer by the Directors of Messrs. Imperial Chemical Industries, Ltd., to place at their disposal a sum of money to found a Rosenhain Memorial Medal.

The medal, which is now being designed, will be awarded annually for outstanding contributions in the field of physical metallurgy, and will be open to individuals under 45 years of age, irrespective of sex or nationality.

Further particulars will be published in due course.

LE CHATELIER CENTENARY

The Council has appointed Mr. H. S. TASKER, President-Elect, to be its representative on a Comité d'Honneur in connection with the organization, by the Société Française de Métallurgie, of a special meeting in Paris on 18 October 1950 to commemorate the centenary of the birth of Henry Le Chatelier, who was an Original Member of the Institute of Metals and was elected an Honorary Member in 1912.

BINDING OF THE JOURNAL

The Council has decided that in view of the size which it has now reached, the *Journal* shall in future be bound in two volumes per year instead of one as at present. This represents a return to pre-war practice. The volumes will run from September to February and March to August, and the change is being put into

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effect at once. The present issue of the *Journal* accordingly starts a new volume.

Members who wish to bind their *Journals* and *Metallurgical Abstracts* will in future be supplied, on request, with three binding cases per year instead of two. There will also be two special issues of the *Journal* per year, containing title page, contents, discussions, &c., and the discussions at the Annual General Meeting of the Institute will appear in one of these and not in the August issue of the *Journal*, as in the past two or three years.

The change in no way affects *Metallurgical Abstracts*, which will continue to be bound in one annual volume.

SEPARATE COPIES OF PAPERS

As a special service to Institute members only, separate copies of all papers published in the *Journal* are now available at a cost of 25s. per annum, post free. Sets of papers are obtainable only by annual subscription and are despatched monthly. The service began with the papers published in the September 1949 issue of the *Journal* and new subscriptions can still be back-dated to that time.

The service is a convenience to those members who wish to avoid taking a number of different issues of the *Journal* to meetings, and also to Librarians. Subscriptions should be sent to the Secretary.

METALLURGICAL ABSTRACTS

The Editor would be interested to hear of any metallurgists with a knowledge of Italian or Russian who would be willing to undertake the abstracting of scientific and technical papers in these languages.

DISCUSSION OF PAPERS

In order to assist the Committee responsible for arranging the programmes of the General Meetings of the Institute, will all members who are prepared to discuss orally any of the papers published in the *Journal* please inform the Secretary as soon as possible.

It is hoped that such information will enable programmes to be arranged which will secure well-attended and lively discussions.

ELECTION OF ORDINARY MEMBERS AND STUDENT MEMBERS

The following 14 members and 29 student members were elected on 14 March 1950:

Ordinary Members

APPLETON, Ronald John Walter, Chairman and Managing Director, Esavian, Ltd., 181 High Holborn, London, W.C.1.

BINNEY, Humphrey Lockhart, M.A., Engineer, Capper Pass and Son, Ltd., Bedminster Smelting Works, Bristol.

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- CARMINA, Rosario, Technical Manager, Industria Nazionale Alluminio, via F. Turati n. 18, Milano, Italy.
- EWEN, Ian Elrick, Chief Engineer and Deputy Director, The United Wire Works, Ltd., Granton, Edinburgh.
- LÁSZLÓ, Franz Michael, Dr. Ing., Lecturer in Engineering, Engineering School, University of Melbourne, Australia.
- LINDH, Erik Gunnar, Metallurgist, A.B. Bofors, Bofors, Sweden.
- MCCONNELL, Alex McD., Metallurgical Chemist, Vulcan Boiler and General Insurance Co., Ltd., 67 King Street, Manchester 2.
- NICHOLLS, Christopher, Chief Assistant Metallurgist, The North-Eastern Marine Engineering Co. (1938), Ltd., Wallsend-on-Tyne, Northumberland.
- NORÉN, Tore M. I., Chief of the Metallurgical Laboratory, ESAB, Gothenburg, Sweden.
- PANDURANGIAH, Vummidi, Partner, Vummidi Ramiah Chetty Guruswamy Chetty and Co., 23-25 N.S.C. Bose Road, Madras, India.
- PONTREMOLI, Pio, Joint Technical Manager, Industria Nazionale Alluminio, via F. Turati n. 18, Milano, Italy.
- SCHRERO, Morris, B.S., Technology Librarian, Carnegie Library of Pittsburgh, 4400 Forbes Street, Pittsburgh 13, Pa., U.S.A.
- SIDDIQI, Rafir Ahmad, B.Sc., c/o Royal Arsenal Laboratory, Metallurgy Branch, A46, Woolwich, London, S.E. 18.
- TUCKER, Herbert Toyne, B.Sc., Chief Chemist, Metal Sales Company (Pty.), Ltd., P.O. Box 44, Benoni, South Africa.

Student Members

- AUSTIN, Peter, Student of Metallurgy, Sheffield University.
- AZIZ, Mostafa Kamal Abdel, B.Sc., Post-Graduate Student of Metallurgy, Eidgenössische Technische Hochschule, Zürich, Switzerland.
- BIGGS, Derek Leonard, Student of Metallurgy, Battersea Polytechnic, London, S.W. 11.
- CARTMELL, Leo John, Student of Metallurgy, Royal School of Mines, London, S.W. 7.
- CONDER, Peter, Student of Metallurgy, Royal School of Mines, London, S.W. 7.
- CROWTHER, John Raymond, B.Sc., Metallurgist, Northern Aluminium Co., Ltd., Handsworth, Birmingham 21.
- DONALDSON, John William, Student of Metallurgy, Royal School of Mines, London, S.W. 7.
- ELKINGTON, Ronald William, Student of Metallurgy, Royal School of Mines, London, S.W. 7.
- FLEMING, Graham, Student of Metallurgy, Royal School of Mines, London, S.W. 7.
- HALL, John Richard, Student of Metallurgy, Royal School of Mines, London, S.W. 7.
- HARBORD, Reginald John, Student of Metallurgy, Royal School of Mines, London, S.W. 7.
- HARRIS, Derek William, Student of Metallurgy, Rotherham Technical College, Rotherham, Yorkshire.
- HAWLEY, William H., Jr., B.S., Post-Graduate Student of Metallurgy, Hammond Metallurgical Laboratory, Yale University, New Haven, Conn., U.S.A.
- HOLT, Martin Oswald, Student of Metallurgy, Royal School of Mines, London, S.W. 7.

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- LAKER, William Eric, B.Sc., Physicist, West Works Laboratory, Bristol Aeroplane Co., Ltd., Filton, Bristol.
- MACKAY, James Matthew, Student of Metallurgy, Royal School of Mines, London, S.W.7.
- MEHTA, Surendra Raj, Student of Metallurgy, University College, Cardiff, South Wales.
- MICHAEL, Anthony Dennis, B.Sc., Research Metallurgist, J. Stone and Co., Ltd., Deptford, London, S.E.14.
- MOIR, Douglas Newlands, Student of Metallurgy, Royal School of Mines, London, S.W.7.
- PALMER, Arthur Robert, Student of Metallurgy, Royal School of Mines, London, S.W.7.
- PELL, Frederick Roy, Metallurgist, Hayward-Tyler and Co., Ltd., Luton, Bedfordshire.
- PILE, Bryan Harold, Student of Metallurgy, Royal School of Mines, London, S.W.7.
- PORTER, John Moser, Student of Metallurgy, Leeds University.
- POTTER, Pat, Student of Metallurgy, Royal School of Mines, London, S.W.7.
- SPRAY, Charles Alan Francis Thomas, Student of Metallurgy, Royal School of Mines, London, S.W.7.
- STRONG, Geoffrey Victor, Student of Metallurgy, Royal School of Mines, London, S.W.7.
- TREHEARNE, Edward Brian Geoffrey, Student of Metallurgy, University of Birmingham.
- WILLIAMS, Clifford Douglas, Student of Metallurgy, Royal School of Mines, London, S.W.7.
- WINGROVE, David John, Chemist, Associated Lead Manufacturers, Ltd., 308 West Ferry Road, London, E.14.

PERSONALITIES



New President, Vice-Presidents,
and Members of Council

MR. H. S. TASKER, B.A.
(President)

Mr. Hubert Sanderson Tasker, who has been elected President of the Institute, was born in 1885 and educated at King Edward's School, Birmingham, and Emmanuel College, Cambridge (Scholar). He joined the staff of Cookson and Company, Ltd., Newcastle-upon-Tyne, in 1910, and became a Director of the Company in 1920.

In 1927 he was appointed Managing Director of Associated Lead Manufacturers, Ltd., and subsequently Managing Director of Goodlass Wall and Lead Industries, Ltd., on the

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formation of that Company in 1931. He became Vice-Chairman in 1940 and Chairman in 1947. He is also Chairman of the British Titan Products Co., Ltd.

Mr. Tasker is a Vice-President of the British Non-Ferrous Metals Research Association. He was elected a member of the Institute in 1933, and served as a Member of Council from 1938 to 1942 and as a Vice-President from 1942 to 1945 and again since 1948. He was Chairman of the Finance and General Purposes Committee from 1940 to 1944, and from 1945 to 1947 was Honorary Treasurer, in which capacity he performed outstanding service to the Institute.

PROFESSOR H. O'NEILL, M.Met., D.Sc. (Vice-President)

Professor Hugh O'Neill was born at Sheffield in 1899, and graduated M.Met. at the University of Sheffield in 1921, after a break at H.M. Factory, Oldbury, from 1917 to 1918, and service in the Royal Engineers in 1918-19. He was awarded the degree of D.Sc. of the University of Manchester in 1929.

He was lecturer in Metallurgy at the Birmingham Technical College in 1920-21, and was a lecturer and later Senior Lecturer in Metallurgy at the University of Manchester from 1921 to 1934. He then became Research Metallurgist to the L.M.S. Railway Company, and was Chief Metallurgist from 1935 until 1947. Since that date he has been Professor of Metallurgy at University College, Swansea.

He is the author of "The Hardness of Metals and its Measurement" (1934), "Glossary of Terms for Metallurgical Inspection" (1940), and about fifty published scientific papers and articles. He was awarded the Trevithick Premium for a paper to the Railway Division of the Institute of Civil Engineers (1945), and the Price-Abell Medallion of the Derby Society of Engineers (1938). He was twice elected Carnegie Scholar of the Iron and Steel Institute.

Professor O'Neill was President of the Manchester Metallurgical Society in 1929-30. He was a member of the old Welding Research Council and the Research Board of the Welding Research Association until 1949; he is a Vice-President of the Institution of Metallurgists, a member of many metallurgical committees, and D.S.I.R. Visitor to the British Cast Iron Research Association.

In connection with industrial and University work, he has travelled in fourteen foreign countries, and was a member of the



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British Committee of World Student Relief. He has given W.E.A. and other adult education courses, and was a member of Derby Education Committee.

Professor O'Neill was elected a member of the Institute in 1921, and has served as a Member of Council since 1946. He is Chairman of the Institute's Publication Committee.

PROFESSOR F. C. THOMPSON, D.Met., M.Sc. (Vice-President)

Professor Frank Charles Thompson was educated at the Sheffield Royal Grammar School and King Edward VII School in the same city. Entering the Metallurgical Department of the University of Sheffield in 1908, he graduated in 1911, being awarded the Mappin Medal. After spending a year taking further courses in pure science, he took a London B.Sc. in 1912 and in that year was appointed to Professor Arnold's staff in the University of Sheffield, where he assisted with the teaching of metallography. During the 1914-18 war he served with the R.A.M.C. as an X-ray operator and as a part-time inspector of cupro-nickel for the Ministry of Munitions. For a short time he was with the Mechanical Warfare Department, in charge of specifications for tank armour.



In 1920, he was appointed Sorby Research Fellow and worked in the University of Sheffield on the etching properties of the carbides in the alloy steels and the abnormal change points in iron below the carbon change point. After assisting as a part-time lecturer in the Metallurgical Department of the University of Manchester, he was appointed to the Chair of Metallurgy in 1921.

His research interests have centred mainly around problems dealing with stress effects in metals, and particularly with the drawing of wire, and, in more recent years, in the measurement of damping capacity. He has served as President of the Institute of Welding.

He was elected a member of the Institute of Metals in 1917, and has served on the Council from 1924 to 1931 and again since 1946.

MR. G. L. BAILEY, M.Sc. (Member of Council)

Mr. George Leo Bailey was born in 1901 and educated at King Edward VI Grammar School, Five Ways, Birmingham, and at Birmingham University, where he graduated in metallurgy in 1921.

He held a Bowen Research Scholarship in the Metallurgy Department at Birmingham in the year 1921-22 and was awarded the degree of M.Sc. in 1922 for his post-graduate research.

In 1922 he joined the staff of the Metallurgical Branch of the Research Department, Woolwich, where he remained until 1930 when he took up a post with the British Non-Ferrous Metals Research Association. He has served with the Association first as Chief Officer of the Development Department, later as Deputy Director, and since November 1944 as Director.

Mr. Bailey's main research work has been in the field of the casting of metals and alloys, particularly in the casting of brass ingots, and he was the joint author with Dr. R. Genders of a monograph on this subject. He has contributed a number of papers to the *Journal* of the Institute of Metals.

He has served on various metallurgical committees of the Ministry of Supply and the Admiralty, and is a member of the Inter-Service Metallurgical Research Council.

Mr. Bailey was elected a member of the Institute of Metals in 1921 and served as an Ordinary Member of Council from 1940 to 1944 and as a Vice-President from 1944 to 1947. He remained on the Council until June 1949 as an Honorary Member of Council representing the Institution of Metallurgists, of which he was a Founder Member and Vice-President from 1946 to 1949.



MR. HARRY DAVIES (Member of Council)

Mr. Harry Davies was born in 1891 and educated at King Edward VI Grammar School, Stourbridge. He was an articled pupil of Joseph Lones, F.I.C., Public Analyst, from 1907 to 1911, and studied metallurgy from 1911 to 1915 at Birmingham University, where he was awarded a Bowen Research Scholarship in 1915.



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He has held the appointments of Metallurgist to the Dunlop Rubber Co., Ltd., Birmingham (1915-1917); Research Metallurgist to Rudge-Whitworth, Ltd., Coventry and Birmingham (1917-1920); Senior Chemist and Metallurgist, Elliott's Metal Co., Ltd. (and later I.C.I., Ltd.), Birmingham (1920-1934); Chief Metallurgist, I.C.I., Ltd., Landore, Swansea (1934-1938), and has been Technical Manager at Landore since 1938.

Mr. Davies was Lecturer in non-ferrous metallurgy at the Birmingham Technical College from 1916 to 1934 and Senior Vice-President of the Birmingham Metallurgical Society in 1933. He was elected a Fellow of the Institution of Metallurgists in 1946.

He served as an Ordinary Member of Council from 1937 to 1939 and again from 1946 to 1948, while Chairman of the South Wales Local Section.



MR. E. H. JONES (Member of Council)

Mr. Edward Henry Jones was born in 1902 and was educated at Port Talbot County School and Swansea Technical College.

From 1919 he worked in the Laboratory of Vivian and Sons, Swansea, and in 1925 joined Capper Pass and Son, Ltd., becoming Works Manager of the Bristol Works in 1938 and a Director of the Company in 1943.

He was elected an Associate of the Institute of Chemistry in 1938, a Member of the Institution of Mining and Metallurgy in 1943, and a Member of the Institute of Metals in 1946.

DR. L. B. PFEIL, O.B.E., D.Sc., A.R.S.M. (Member of Council)

Dr. Leonard Bessemer Pfeil was born in London in 1898 and educated at St. Dunstan's College. After service in the R.A.F. he went to the Royal School of Mines, obtaining the A.R.S.M. in 1921, with the Bessemer Medal. In the same year he graduated at London University, with first class honours in Engineering Metallurgy, later obtaining the M.Sc. and D.Sc. degrees of the same University.

In 1921 he became Assistant Lecturer in Metallurgy in the University of Swansea, and in 1927 was appointed Lecturer, a position which he occupied until 1930, when he joined The Mond Nickel Co., Ltd., as Assistant Manager of the Research and Development Department, taking charge of the Research Laboratory at Birmingham. In 1945 he was appointed Manager

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of the Department, with headquarters in London. He is a Director of Messrs. Henry Wiggin and Co., Ltd.

During the war Dr. Pfeil was responsible for researches on high-temperature alloys for gas turbines which led to the development of the now well-known "Nimonic" series of alloys, and was also closely associated with other investigations connected with the war effort. He was awarded the O.B.E. in 1947.

He is the author of many papers dealing with single iron crystals, the mechanism of scaling, ageing embrittlement, age-hardening of copper-nickel alloys, precious metals, powder metals, the hardening of steel, and the constitution and properties of high-temperature alloys.

Dr. Pfeil was elected a member of the Institute of Metals in 1923. He served on the Council previously from 1945 to 1949, and has been Chairman of the Publication Committee. In 1946 he was elected a Fellow of the Institution of Metallurgists, and is a member of the Iron and Steel Institute, the American Society for Metals, the American Society for Testing Materials, the American Institute of Mining and Metallurgical Engineers, and the Electrochemical Society. He is also a member of several Committees of the British Non-Ferrous Metals Research Association and the British Iron and Steel Research Association, and of various Governmental Committees dealing with the properties and uses of metals and alloys.



MAY LECTURER 1950

Dr. H. ROXBEE COX

Dr. H. Roxbee Cox was born at Handsworth, Birmingham, in 1902. He was educated at Kings Norton School, Birmingham, and left there in 1918 to join the aircraft design department of the Austin Motor Co., under the late John Kenworthy.

In 1922, having obtained a first-class honours degree in engineering by private study, he went to the Imperial College of Science and Technology for advanced study and research in aeronautics under Professor Bairstow, obtaining the Diploma of the College and the degree of Doctor of Philosophy.

In 1924 he joined the Royal Airship Works, and for the next five years worked on the design of the airship R.101. An outcome of this period was the award to him of the R.38 Memorial Prize for his essay on "The External Loads on an Airship Structure".

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Dr. Roxbee Cox joined the Airworthiness Department of the Royal Aircraft Establishment in 1929, but returned to the Royal Airship Works in 1931 as Chief Technical Officer, an appointment ending later in the year when the Government decided to discontinue airship work. He returned to the Royal Aircraft Establishment and renewed his investigations into wing flutter, aircraft structure, and aerodynamics; in 1936 he became Head of the Air Defence Department at the Establishment.

At the beginning of 1938 he was appointed Chief Technical Officer to the Air Registration Board, which controls the airworthiness of British aircraft. On the outbreak of war, however, Dr. Roxbee Cox returned on loan to the Government Service as Superintendent of Scientific Research at the Royal Aircraft Establishment. In 1940 he became Deputy Director of Scientific

Research in the Air Ministry and took up with enthusiasm the cause of the jet-propulsion gas turbine.

The work continued under the Ministry of Aircraft Production, and Dr. Roxbee Cox became Director of Special Projects. In this capacity he was closely associated with all the British gas-turbine work, and was responsible among other things for conducting the fruitful liaison which developed in this field with the U.S.A. and for instituting the Gas Turbine Collaboration Committee.

He vacated this post in 1944 to become Chairman and Managing Director of Power Jets (Research and Development), Ltd. In 1946, this Company became a Government Establish-

ment under the title of the National Gas Turbine Establishment, and he became its Director.

In 1948 Dr. Roxbee Cox was appointed Chief Scientist to the Ministry of Fuel and Power, a position which he still occupies.

He was President of the Royal Aeronautical Society from 1947 to 1949. He is a Governor of the College of Aeronautics, a member of the Institution of Mechanical Engineers, a Fellow of the Institute of Fuel, a member of the London Mathematical Society, a foreign Fellow of the Institute of Aeronautical Sciences (U.S.A.), and an Honorary Member of the Association des Ingénieurs de la Faculté Polytechnique de Mons. He is the author of numerous papers on civil aviation, aircraft technology, engineering structures, and gas turbines. He read the Wilbur Wright Memorial Lecture of the Royal Aeronautical Society in 1940 on civil aviation, and the Wright Brothers Memorial Lecture of the Institute of Aeronautical Sciences in 1945 on gas turbines.



PERSONAL NOTES

PROFESSOR E. BRANDENBERGER has been elected Vice-President of the Schweizerischen Verbandes für die Materialprüfungen der Technik, Zürich.

DR. LUIZ C. CORRÊA DA SILVA has received the D.Sc. degree of the Carnegie Institute of Technology, Pittsburgh, Pa., where he has been working, and has now returned to the Instituto de Pesquisas Tecnológicas, São Paulo, Brazil.

PROFESSOR F. A. FORWARD, of the University of British Columbia, who has been awarded a Nuffield Foundation Travelling Fellowship in Extraction Metallurgy, arrived in England recently. Correspondence may be addressed to him c/o The Nuffield Foundation, 12 Mecklenburgh Square, London, W.C.1.

DR. MARIE L. V. GAYLER has been re-appointed External Examiner in Metallurgy at Birmingham University for the session 1949-50.

MR. A. P. C. HALLOWES has left the British Non-Ferrous Metals Research Association and has joined the staff of the Copper Development Association.

MR. J. C. HANNAM has left the British Iron and Steel Research Association to take a post in the Metallurgy Department, Royal Aircraft Establishment, Farnborough, Hants.

MR. C. V. HICKSON left England in January to take up an appointment with N'Changa Consolidated Copper Mines, Ltd., Northern Rhodesia.

MR. J. O. HITCHCOCK has been appointed Assistant Managing Director of Henry Wiggin and Co., Ltd.

MR. H. A. HOCKING has been appointed Technical Representative of The Mond Nickel Co., Ltd., at Zürich.

DR. BRYNMOR JONES has been elected to the Board of Directors of the Whitehead Iron and Steel Co., Ltd., Newport, Mon.

MR. B. KRISHNAMURTHY is now with the Indian Aluminium Co., Ltd., Belur Math Post, W. Bengal.

MR. W. K. B. MARSHALL has relinquished his post as Assistant Director of Research of the British Welding Research Association, and joined Rockweld, Ltd., Croydon, to take charge of their Technical Development Department.

MR. R. A. MILLER has been appointed Joint General Manager (with Mr. R. D. Hume) of Foundry Services, Ltd., Nechells, Birmingham. He was previously Technical Manager.

MR. S. T. QUAASS has left the Metallurgy Department, University of Melbourne, where he has been engaged in post-graduate research and has become research metallurgist to Rotocast Pty., Ltd., 168-174 Euston Rd., Alexandria, Sydney, N.S.W.

PROFESSOR DR.-ING. P. RÖNTGEN, of the Institut für Metallhüttenwesen und Elektrochemie, Aachen, is seriously ill.

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PROFESSOR DR. M. ROŠ has resigned his post as President of the Schweizerischen Verbandes für die Materialprüfungen der Technik, Zürich, and has been elected Honorary President. Professor Roš was Founder of the Schweizerischen Verbandes, of which he has been President since 1926.

MR. F. M. THOMAS has left Needle Industries, Ltd., to take up an appointment at National Oil Refineries, Ltd., Llandarcy, Neath, Glam.

MR. G. P. TINKER has been appointed Managing Director of Birlec, Ltd., in succession to the late Mr. A. Glynn Lobley.

PROFESSOR DR. A. VON ZEERLEDER has been elected President of the Schweizerischen Verbandes für die Materialprüfungen der Technik, Zürich.

NEWS OF LOCAL SECTIONS AND ASSOCIATED SOCIETIES

BIRMINGHAM LOCAL SECTION

Symposium on the Investigation of Alloy Systems.

An all-day Symposium on "The Investigation of Alloy Systems" was held at the Chamber of Commerce, Birmingham, on Friday, 10 March 1950. Mr. R. Chadwick, M.A., Chairman of the Birmingham Local Section, occupied the Chair at the morning session. The Chairman for the afternoon session was Mr. B. Thomas. The President of the Institute, Sir Arthur Smout, was unavoidably prevented from being present.

After an introduction to the Symposium by Professor D. Hanson (Feeney Professor of Theoretical and Industrial Metallurgy at the University of Birmingham), four papers, of which summaries are printed below, were read and discussed. In the evening a dinner was held at the Imperial Hotel, Birmingham.

Some Aspects of the Practical Application of Alloy Phase Diagrams. By E. H. Bucknall, M.Sc., F.I.M., and P. Hersch, Ph.D.

Although the Phase Rule was propounded over 70 years ago, not all metallurgists have yet been persuaded of the practical value of phase diagrams. This position seems to be in part a result of overemphasis of the restrictions put on the Phase Rule by Gibbs, and to have been encouraged by the almost universal treatment of alloy systems as condensed systems, even when a vapour phase is present.

Primary extraction metallurgy rests firmly on a phase-diagram basis, though this is not in the main concerned with alloy systems so much as with equilibria between sulphides, oxides, and the like. The separation of lead and zinc via the vapour phase is an outstanding example of the application of an alloy phase diagram in process metallurgy. Other examples are furnished by refining processes based on the co-existence of two liquid phases (or of solid and liquid phases) of widely differing compositions. An

aspect of refining operations of special interest in the present connection is the treatment of impure metals by means of additions which precipitate the impurity as a compound. This type of treatment is readily explained by means of a ternary phase diagram, and from this the effectiveness of the addition can usually be assessed. Again, phase diagrams teach valuable lessons applicable to the preparation of alloys.

In "application metallurgy" phase diagrams are often used in extremely practical ways (*a*) to predict the structure of alloys in a known system, (*b*) to assess from the structure the heat-treatment to which alloys have been subjected, (*c*) to define the property trends expected in the system, (*d*) to form the basis of predictions of the probable run of more complex systems, and (*e*) to arrive at generalizations on the constitution of alloys. Quantitative applications are restricted to equilibrium conditions, but useful indications can be given for non-equilibrium conditions, e.g. in relation to segregation, to changes during solidification, and to structures set up by interdiffusion, as in scaling, welding, and brazing.

A special instance of a property which is closely allied to phase constitution in alloys is creep-resistance. The development of alloys which occupy a unique place in the high-temperature field was made on the basis of solid-solubility determinations, interpreted in terms of a "marginal solubility principle".

Instances in which the form of a phase diagram has suggested heat-treatment schedules are well-known. For example, valuable lessons regarding the decomposition of undercooled austenite can be derived from the (metastable) phase diagram of the iron-iron carbide system. The search for age-hardening alloys is largely a matter of finding cases where the solid solubility decreases with fall in temperature. Gayler has drawn attention to the fact that in some such systems the distribution of the precipitated phase is controlled by the degree of supersaturation.

The presentation of examples of actual and potentially practical applications of phase diagrams clearly establishes the important contribution which they are able to make to metallurgical practice, but exposes certain difficulties, e.g. where the attainment of equilibrium is sluggish and where individual parts of an alloy move separately towards a "local equilibrium". Other difficulties are caused by limitations of published diagrams, e.g. omission of tie-lines and (what is very unsatisfactory) attempted representation of systems with volatile or gaseous constituents by means of isobaric sections. For diagrams to be of the greatest practical value, conclusions reached with metals of special purity should be checked with metals of normal quality, and attention should be drawn to any special steps taken to secure equilibrium. The introduction of a shorthand system of denoting types of alloy structure would be advantageous.

Thermal Analysis. By C. Sykes, D.Sc., F.R.S.

Any change in state, i.e. from liquid to solid, or of structure in the solid, such as a phase change, is accompanied by a change in energy, and heat is either evolved or absorbed. Consequently, experimental methods which reveal such thermal changes are used in the investigation of alloy systems for such diverse problems as the location of liquidus and solidus lines, transformations in the solid from one type of crystal lattice to another, order-disorder

transformations, precipitation phenomena, magnetic transformations, &c.

There are a variety of experimental methods* which may be used, perhaps the most common being the inverse-rate heating and cooling curve, and the most sensitive the determination of specific heat. The choice of method to be used will depend on the type of transformation being investigated and the accuracy of the information required.

Thus, many transformations—including the solidification of a pure metal and certain phase changes in the solid—occur at a constant temperature, i.e. latent heat is evolved. The inverse-rate curve is perfectly satisfactory for the determination of such transformation temperatures, but it gives little quantitative information as to the amount of heat involved.

Where the transformation takes place over a range of temperature, that is, there is little latent heat but merely an increase in specific heat, then either the inverse-rate curve or the differential cooling curve will give results which are very difficult to interpret correctly.†‡ In such cases, e.g. cooling curves on complex alloy steels, a method should be used‡ which records simultaneously the cooling rate of the specimen and the temperature difference between it and the surroundings. By combining this information, an approximate specific-heat curve can be derived which is less likely to misrepresent the true course of the transformation.

For precise evaluation of transformation characteristics, particularly when the rate of heat evolution is small, precision methods giving accurate specific heat measurements should be used.§ These methods involve working in a high vacuum in a uniform temperature enclosure, and so far are restricted to the investigations of transformations in the solid state.

The Use of High-Temperature X-Ray Technique in the Establishment of Alloy Constitutional Diagrams. By E. C. Williams, M.Sc., A.Inst.P.

In many alloy systems solid phases existing at elevated temperatures transform on cooling into other phases and therefore cannot be retained even by drastic quenching. For analysis of the crystal structure of such phases, X-ray observations must clearly be made at those temperatures at which they are in equilibrium. Technical difficulties associated with this procedure have restricted its application in the past to investigations where it appeared indispensable, but recent developments and refinements of technique make possible its more general use.

Reference is made to some applications of high-temperature X-ray techniques which have appeared in the literature. The first, and probably the most important in its contribution to metallurgical knowledge, was the elucidation of the true nature of the allotropy of pure iron. Subsequent applications have reference to the iron-nickel and aluminium-zinc systems. Several binary non-ferrous systems have been investigated, and, in particular, the β phases of constitutionally similar binary alloys of

* C. Sykes, *Proc. Roy. Soc.*, 1935, [A], 148, 422.

† T. F. Russell, *J. Iron Steel Inst.*, 1939, 139, 147 P.

‡ F. W. Jones and C. Sykes, *ibid.*, 537 P.

§ C. Sykes and F. W. Jones, *J. Inst. Metals*, 1936, 59, 257.

E. Griffiths, *Iron Steel Inst. Special Rep. No. 24*, 1939, 215.

copper and silver have been shown to possess a body-centred-cubic structure.

The general problems involved in designing high-temperature cameras are discussed. These for the most part arise from the necessity of maintaining a specimen under examination at a high temperature in such a way that it does not become contaminated through oxidation or otherwise, and also so that diffracted radiation from the specimen is not heavily absorbed before it reaches the recording X-ray film or Geiger counter. Furthermore, the temperature of the specimen must be kept constant to at least 1°C . during the exposure, to prevent broadening of the diffraction lines through fluctuation in lattice parameter, and the temperature must be accurately measurable if the results are to be of value in establishing constitutional diagrams. In addition, there are the usual requirements of X-ray diffraction methods to be met, involving the use of precision-built apparatus.

Much work has gone into the design of high-temperature cameras, and descriptions of several instruments, which are mostly of the Debye-Scherrer type for use with powder or fibre specimens, have appeared in the last fifteen years. The Debye-Scherrer method is the one generally used in identifying crystalline phases. Single-crystal methods are not of wide applicability in comparison. A modification of the powder method involves directing the primary X-ray beam at a glancing angle to a plane surface on a solid specimen, such as a metallographic micro-section. This has become popular in X-ray metallography in recent years, but it has its limitations from the point of view of X-ray technique, and requires more complicated apparatus. Used in conjunction with observations at elevated temperatures, however, it has the merit of facilitating direct measurement of temperature by means of a thermocouple attached to the specimen, which is not possible with fibre-mounted powder specimens. A new high-temperature camera designed for use with solid specimens as well as powders is described.

Approach of Alloys to Equilibrium, with Reference to Recent Work. By D. McLean, B.Sc.

The subject is discussed mainly in connection with precipitation. The theoretical background is introduced first and illustrated by recent work.

The two basic factors determining the sequence of changes in an alloy are the magnitude of the free-energy decrease accompanying each change, and the rate of each change. The final, equilibrium condition is that which has the lowest free energy, but the first state to form from an initial unstable condition is the one which forms fastest under the particular conditions. This explains why equilibrium is often attained via transition stages, and is illustrated by the recent work on the tempering of martensite.

Changes in metals often occur by the formation of growth of nuclei. The factors determining the rates of these are indicated with main reference to those relevant to the changes in the iron-nickel system and the tempering of steels discussed later. Estimation of the rates of formation and growth requires very detailed knowledge of the energy relationships on an atomic level. However, if values for these rates are assumed, the relationship between amount of transformed material and time can be deduced as a

mathematical consequence and gives the appearance of an incubation period even where it does not actually exist.

Changes without nucleation and growth may occur, for example, clustering in solid solutions and strain-induced segregation. Suggestions have been made that the latter effect is responsible for some cases of brittleness and for the yield point in mild steel.

A study of $\alpha \leftrightarrow \gamma$ transformations in iron-nickel alloys by Allen and Earley has shown that in the direction $\alpha \rightarrow \gamma$, transformation can occur by a nucleation and growth process involving diffusion as well as by a diffusionless transformation. The former process is found to proceed faster the closer the representative point in the phase diagram is to the $\gamma/(\alpha + \gamma)$ phase boundary. If this is interpreted to mean that the rate of transformation is governed by the probability of occurrence of groups of atoms of the equilibrium γ composition, the actual nucleus size can be estimated.

Recent work on the tempering of martensite, using the electron microscope, X-ray, and electron-diffraction methods, has helped to clarify the confused position here, at least as far as the precipitate phase is concerned. Tempering occurs in overlapping stages as the temperature is raised. Very fine particles are first formed, then small platelets, and finally rounded cementite particles. The X-ray and electron-diffraction work by Calnan and Clews and by Jack has succeeded in making it clear that three precipitates are involved and in identifying the lattice structure of each.

Some Aspects of the Practical Thermodynamics of Alloys. By Professor G. V. Raynor, M.A., D.Sc.

The experimental study of the thermodynamics of alloy formation is of interest to the physical metallurgist, since quantitative information can be obtained with regard to certain factors affecting alloy formation, about which present knowledge is somewhat qualitative. The electron theory of alloys, by itself, is of limited application, and further knowledge is needed with regard to the energetics of the formation of alloys. Experimental techniques exist for obtaining such data, and two of the most straightforward are based upon measurements of (i) vapour pressures of alloys, and (ii) electromotive forces developed between the alloys and their less noble component. These measurements may be analysed to give the *activities* of the alloy components. The *activity* of a component is related to its concentration by the equation $a = fN$, where N is the mol fraction present and f is the activity coefficient, and, in effect, measures the deviation from ideal behaviour in a particular metallic system. From the activity values, free-energy/composition curves can be worked out.

In the vapour-pressure technique, the partial pressure of the volatile component of a metallic system is measured; one of the most important examples of this technique is provided by the work of Hargreaves. The ratio p_x/p_x^0 , where p_x is the partial vapour pressure of the volatile component over the alloy, and p_x^0 the vapour pressure of the pure component at the same temperature, is equal to a_x , the activity, which varies with composition. Curves of activity against composition may be correlated with the form of the equilibrium diagrams. In general, systems in which there is a high electrochemical factor show considerable negative

deviations from linearity when the activity is plotted against composition; systems containing wide miscibility gaps between the components show positive deviations.

The electromotive-force method involves the accurate measurement of the e.m.f. of a cell which consists of an alloy electrode and an electrode of the less noble component in a suitable solid or fused-salt electrolyte. The temperature at which the experiment is carried out must be high enough for diffusion to occur in the alloy. The e.m.f. represents the change in free energy on transferring one molecule of a metal into an alloy of mol fraction N , i.e. the partial free-energy change, from which the appropriate activity values may be obtained. If the activity of the other component is also determined, the integral free-energy change is calculable, and may be plotted against composition.

From the thermodynamic quantities determined by experiment, the heats of formation of alloys and intermetallic compounds, which are of considerable practical and theoretical importance, may be derived. For example, the heats of formation of superlattice structures may be measured by the electromotive-force technique in suitable cases, and more direct studies of the ordering phenomenon, leading to assessments of the degree of order in given alloys, may also be made.

In general, results of much value in the development of the general theory of alloys may be obtained, and further experimental work on the thermodynamics of alloy formation would be a welcome addition to work in progress in other fields of investigation.

LONDON LOCAL SECTION

At a meeting held at 4 Grosvenor Gardens, S.W.1, on 9 February, Mr. E. J. VAUGHAN gave a lecture entitled:

Recent Developments and Modern Techniques in Metallurgical Analysis.

The lecturer said that an enormous increase in analytical inspection brought about by mass-production methods, new knowledge of metals and the function of alloying elements and impurities, and the engineer's demand for greater and greater performance at ever-increasing temperature ranges have challenged the ingenuity of the metallurgical chemist. This challenge has been met by making use of the more physical properties of the elements to bring about a great increase in speed of examination. The fields of chromatography, polarography, absorption and emission spectrophotometry, radioactivity, magnetic and electrical properties, impedance and inductance have all been studied and all have provided new techniques involving the use of instruments from the simplest of light absorptimeters to the most complicated electronic devices. The main trends of present research in the direction of spectrophotometric methods were leading to the design of automatic recording instruments which, without sacrifice of accuracy, would substantially simplify the chemical procedures of the physico-chemical method and, in the case of the spectrographic techniques, enable a detailed analysis of a metal or alloy to be made in a matter of seconds (11 elements in 45 seconds). Instruments based on recordings of magnetic and electrical properties were proving of value in the non-destructive testing for plating thickness and for general comparative properties

of magnetic materials, but the most significant advance in examination methods and production control were being realized by the use of core-loss instruments. Electronic recording devices had been designed to record the losses in output of an oscillating circuit due to the positioning of metallic material so as to be significant in interpretation of chemical composition and structure.

AN INTERNATIONAL METALLURGICAL ASSOCIATION

A LECTURE TO THE SOCIÉTÉ FRANÇAISE DE MÉTALLURGIE *

By RICHARD SELIGMAN, Ph.nat.D., F.C.G.I., F.Inst.Met., F.I.M.

MR. PRESIDENT,

When your colleague, the President of the Institute of Metals, Sir Arthur Smout, asked me to represent the Institute to-night and to present to your Society a lecture on any suitable subject, I accepted the invitation with alacrity and a deep sense of the honour extended to me thereby.

Later, I must admit, grave hesitation supervened as to whether I could find a subject truly suitable for the purpose. For one thing my contacts with Metallurgists and Metallurgy itself are far from being so extensive or so intimate as they were say twenty years ago, and for this reason it seemed very doubtful to me whether I could find a scientific or a technological subject of the normal type which would be worthy of this remarkable occasion.

For the occasion is a remarkable one in more ways than one. It is the first occasion since the war on which the Institute which I represent has held one of its Autumn Meetings outside the United Kingdom of Great Britain. The last time it went abroad was in 1936, and most appropriately, if I may say so, its last foreign meeting before the war, just as its first foreign meeting after the war, was in your beautiful city of Paris and in this magnificent home of Science, La Maison de la Chimie. Still more outstanding is the fact that this is the first time in its history, now extending to forty-one years, that the Institute has held its meeting at the same time and in the same building as a sister metallurgical society and, again most appropriately, with the Society to which some of its own most eminent members belong, members between whom and their British colleagues relations have been of the closest and most friendly throughout the years.

I trust, Mr. President, that you will agree that for these reasons, if not for any other, it was incumbent upon me to select, if I could, a subject of more general interest on which to address you, and it was, indeed for these reasons, that, after consulting some of my friends who take a special interest in the international aspects of science, I decided to raise with you one of the problems involved in the developments which metallurgy like almost every branch of human activity is undergoing in the modern world.

That a representative of the Institute of Metals should select such a subject cannot, I believe, be considered inappropriate. Those of your members who are also members of the Institute

* Delivered at the Maison de la Chimie, 28 rue Saint-Dominique, Paris, 7e, on Monday, 3 October 1949.

must know that the international bearing of its own activities has, from the beginning, played a large part in the deliberations of its Officers and Council who, in this, have invariably had the fullest support of the general body of the members. In this connection I would like to quote, and not by any means for the first time, some words spoken by one of the founders of the Institute, that distinguished metallurgist and close personal friend of my own and many others in this room, the late Sir Harold Carpenter. At a moment when the 1914-18 war was raging at its fiercest he said of the Institute: "We organized ourselves from the beginning as an Institute on an international basis. Thereby we gave a definite pledge to mankind that in our judgment peace and not war was the normal relation between the nations of this earth. Before long we counted among our members metallurgists in every country in which the art is practised. We were in the habit of meeting in friendly scientific intercourse both in this country and on the continent. . . . Are we not entitled to hope that after the return of peace, small though we are in numbers and but little known outside the technical public and technical press, our act of faith constituted one of the nuclei from which the league of nations will ultimately crystallize in a stable and enduring form?"

My audience will not, I hope, take it amiss if I add to this some words of my own, spoken in this room just thirteen years ago. "Ceux qui ont organisé l'Institut . . . ont bien reconnu que la science possède un pouvoir énorme qui lui permet de panser non seulement les blessures du corps mais aussi les blessures de l'esprit humain. C'est pour cela que nous avons tenté, et tenté avec succès, de rassembler sous notre égide, à côté de nos compatriotes, les métallurgistes de toutes les nations. Dans nos séances, dans notre Journal, il y'a ni Français, ni Anglais, ni Italiens, ni Allemands mais seulement des métallurgistes, chacun visant au même but, chacun cherchant à achever les mêmes tâches. . . . Nous croyons pouvoir par ce moyen resserrer plus étroitement les liens qui nous attachent les uns aux autres et éviter les malentendus qui surviennent si facilement, de comprendre les idées de notre vis à vis et surtout de reconnaître que les motifs qui l'activent sont au moins aussi dignes que les nôtres."

You will see from these two quotations, Mr. President, that the promotion of collaboration by the metallurgists of all nations has been one of our main objectives in the past. The fact that I am speaking to you here to-day is evidence enough that the terrible years through which we have passed have not in any way diminished our zeal. On the contrary, I would say that we realize even more fully than we did before, the need to work ever more closely with our colleagues in other lands, and I cannot believe that there is anyone in my audience who would disagree with us on this point.

I need hardly say that I do not suggest that the Institute of Metals is alone in seeking to promote the collaboration of which I speak. That would be far from the truth. The Iron and Steel Institute, for instance, from which the Institute of Metals derived many of its principles, has a long and proud record of international activity in its own field and most, if not all, of the other scientific and technical organizations pursue the same objective and by similar means, although, perhaps, not so intensively or so

consistently as the two sister societies I have named. All of them, I believe, make no distinction in their journals or in their meetings between the nationals of the country in which they are centred and those of other countries; in most of them members from other countries are as welcome as from their own; some of them, but not many, also hold periodic meetings in foreign countries. (I speak, of course, with my eyes directed North, South, and West.) And yet my feeling is that there remains a gap in our armour and that more could be achieved if our activities could be co-ordinated more fully than they are at present; if there were in existence a body which, for my present purpose, I will call an "International Metallurgical Association".

Let me say at once that I am not suggesting the formation of a new metallurgical society in the ordinary sense of the word. That is far from my intention. What I would like to see formed, or perhaps I should say re-formed with modifications, is an organization exclusively concerned with the holding of periodic international gatherings at which a strictly limited number of metallurgical subjects (perhaps even only one) would be ventilated and discussed by those metallurgists from every part of the world who could contribute to their elucidation or to the solution of the problems involved. I will not, at the present moment, give you my views as to how such an organization should be formed or how it should function. With your permission I will return to this section of my subject later in my address. Here let me consider with you what are the limitations, from my present point of view, of our existing metallurgical organizations.

Let me consider first the regular meetings which most of the societies hold. Not so very long ago it was the custom for every paper presented to the society, whether by a citizen of the country to which the society belonged or whether by a citizen of another country, to be read and discussed at these meetings, the control exercised by the Council being limited to ensuring that the subject selected by the author was suited to the society and that the quality of the work and its presentation were satisfactory. To-day that is no longer the case in most societies, and more control is exercised over the programmes for the meetings. As a rule, however, such control does not go beyond the selection from the papers published by the society since the last meeting, of a certain number which are considered particularly suitable for discussion. Sometimes, but by no means always, this selection is made with a view to grouping together two or more papers dealing with related problems.

It results from this that papers dealing with different aspects of the same problem may be discussed at a number of meetings of metallurgical societies in different parts of the world, and in most of our journals we find analogous conditions. If I wish to familiarize myself with the present state of our knowledge on any given subject I must, as a rule, search many journals written, perhaps in as many languages, before I can obtain a true picture. Even then I cannot be sure that some essential fact or vitally important view has not escaped my attention.

Many societies do organize, in addition to or as part of their regular meetings, what are termed general discussions or symposia on subjects appropriate to their constitutions, and the metallurgical societies are among those who have held very useful

meetings of this kind. To give only two examples: There is the "Journées des Etats de Surface" of 1945 to which your Society made an important contribution, and there is the "Symposium on the Effect of Temperature on Metals" of 1931, arranged by the American Society of Mechanical Engineers and the American Society for Testing Materials.

Perhaps the activities in this respect of the Faraday Society have been developed to a greater extent than have those of most other societies and, I may add, the general discussions organized by the Faraday Society appear to me to approach more closely to what I have in mind than do those of most other existing organizations known to me.

It must be well known to many of those present to-day that the Faraday Society, in addition to its normal activities as a scientific society in the wide field of physical chemistry, organizes, at least twice a year, general discussions on selected subjects, many of which are of great interest to metallurgists and some of which deal exclusively with metallurgical problems. Not only is the subject selected, but the organizing body lays down the various sections of the subject into which the discussion is to be divided. Moreover, those taking part in these general discussions include scientists from many countries, and special steps are invariably taken to ensure that all visitors from other countries can take their full part in the proceedings. For some of these discussions any participant is free to present a communication on any aspect of the subject under discussion, but, as a rule, it is the practice to invite those who may be regarded as having specialized knowledge to deal with a definite theme selected by the Council.

The Faraday Society is not an international organization, and its council consists, I believe, exclusively of British members who, though most of them must be in close contact with their colleagues abroad cannot, of course, be as intimately in touch with what is being done in other countries as are those residing and working there.

In this respect the International Congresses of Pure and Applied Chemistry, of which eleven have been held in the past years, are, as their name implies, more truly international. They meet normally at four-yearly intervals and in different countries. There is some continuity in the administration in that the permanent secretariat of the Union de la Chimie, which, as you all know, is domiciled in Paris, undertakes certain watching activities in the intervals between the meetings. However, there is no permanent Council or its equivalent, the Chemists of the country which is to be the host of the next Congress being responsible for organizing the scientific, technical, and social functions. The Congress is divided into a large number of sections which in the past have met concurrently, so that it has frequently happened that those participating have found that a subject which is of particular interest to them is being discussed in one section whilst they themselves are engaged in another section. I gather that the American chemists who are to be the hosts to the next Congress are considering measures to cope with this difficulty. Whether they also have under consideration the planning of the discussions themselves I do not know. Nor do I know whether it is intended to impose any limit on the number of subjects discussed. Quite recently there has been formed the International Institute of

Welding in which one of your and our most distinguished members, Professor Portevin, takes an active interest. It is organized on lines very closely resembling those which I have in mind although its tasks are entirely different.

Those members of my audience who attended the Düsseldorf Meeting of the Institute of Metals in 1929—and I know that there are a few of you who did—may also perhaps have been present at the dinner given in our honour. One or other of them may perhaps recall a speech made on that occasion by my immediate predecessor as President of the Institute, Dr. Walter Rosenhain.* I bring that speech to your notice because in what he said then Dr. Rosenhain outlined an international metallurgical organization which, had it come to life, would have carried out some of the functions which the organization I now have in mind would be called upon to perform. In point of fact Dr. Rosenhain was not successful in his efforts, continued though they were for a considerable period, but a number of his ideas were, if I am not mistaken, given effect to in his conduct of Group A (Metals) of the New International Association for the Testing of Materials (Nouvelle Association Internationale pour l'Essai des Matériaux) which began its activities a year later and of which he was the Group President.

For my present purpose I would like to draw your attention to two points made in Dr. Rosenhain's presidential address to the Group.† In discussing the preparations being made for the then forthcoming meeting to be held in Zürich in 1931, he pointed out that the permanent Committee of the Association had, in the first instance, invited the delegates on the Committee from each country to submit lists of subjects considered to be of particular interest in that country. From the lists submitted the Permanent Committee in its turn selected a strictly limited number of subjects for discussion at the Congress, five in the case of the Metals group. Dr. Rosenhain had hoped, as he told the Group at the opening of the Zürich meeting,‡ that the discussions would have dealt with these five subjects only. In actual fact, however, the diversity of the interests and the pressure put on the organizers made such restriction impossible, and all they had been able to do in this respect was to group a number of diverse subjects under each heading. Thus the whole subject of cast iron was dealt with in a single morning session during which no fewer than five papers were presented and discussed.

Somewhat greater uniformity was, I think, achieved in the next and last Congress, held in London in 1937, but here also the papers, even those presented to one sub-group, covered so wide a field as to include (to quote the titles of two successive communications) "Accurate Chemical Analysis of Aluminium and its Light Alloys" and "The Mechanism of Age-Hardening in Aluminium-Magnesium-Zinc Alloys".

Dr. Rosenhain further pointed out that a very wide interpretation had been put by the committee upon the term "Testing of Materials", and indeed an examination of the contents of the

* Cf. *J. Inst. Metals*, 1930, 43, 35.

† First Communications of the New International Association for the Testing of Materials, Group A—Metals, p. VIII (1930).

‡ Association Internationale pour l'Essai des Matériaux, Congrès de Zürich 1931, Tome I, p. 1.

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volume in question will show that the papers it contains deal with many aspects of ferrous and non-ferrous metallurgy. As we all know, the Association was short-lived, and just as the fruitful work of its predecessor, the original International Association for Testing Materials, was broken off by the first World War so its own activities were brought to an end by the second World War. Had they continued and had they developed along the lines originally suggested by Dr. Rosenhain and under his guidance so far as they dealt with metals, it seems very probable to me that an organization such as I am suggesting to-day might very well have evolved.

What my suggested organization would be must, I think, already be apparent from what I have said in this cursory review of some existing international scientific and technical organizations. Now, if I may, I will look a little closer at its structure and its activities, but in general outline only. This is not the place nor the moment for detailed consideration of the many problems involved. That will be the first duty of those who form the organization if, indeed, it ever sees the light of day. That it would embody many of the features presented by its predecessors is, I think, obvious, but it would also differ in one or more respects from all of those known to me.

The first point it is necessary to make is that the new organization would be an association of existing metallurgical and kindred societies. Individual metallurgists would not be members in their own names, but only through the societies to which they may belong. I assume that there would be no restriction on the number of societies in each country which could be members of the Association, but that membership would be open to all metallurgical and allied societies provided only that they were interested in the objects of the Association.

And so I come to what is the main subject of my thesis, the work which the proposed Association is to perform.

Essentially it is to organize and hold international gatherings very much on the lines on which it had originally been intended that the N.I.A.T.M. (later known as the I.A.T.M.) Congresses should be organized and held, but with several very definite differences.

It will be clear that I have in contemplation conferences at which only metallurgical subjects would be discussed and not, as was previously the case, many other subjects as well.

Then again my suggestion is that the conferences should be held more frequently, but, on the other hand, that there should be far greater limitation of the subjects discussed than at any of the regular international conferences about which I am informed. Indeed I would prefer that for each conference, which might perhaps be held annually, only one subject should be discussed, but that that subject should be discussed much more thoroughly than heretofore and from every possible point of view. It is even conceivable that one conference might not always suffice to dispose of the subject selected and that it would be desirable to defer the* discussion of some part or parts of it until a later occasion.

As an example of what I have in mind I may perhaps suggest that at a given conference a metallurgical subject of great importance be presented and discussed by the scientists most inti-

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mately concerned in its development. It might be reserved for a future conference to discuss the practical application to industry of information those scientists have given to the world.

For my own part I would prefer that wherever possible both the purely scientific aspects of any subjects and their application to practice should be discussed at the same conference. The ideal, from my point of view, would be if, for instance, a morning session could be devoted to one purely scientific aspect and the afternoon session to its influence on practice. In this way one of the chief objects I have in mind would be achieved, namely the bringing into the closest possible contact of the scientists who are exploring the subject for the elucidation of which the conference has been convened and the technicians whose duty it will be to apply the knowledge with which the scientists have provided them.

It may well be, Sir, that you or your colleagues might agree to some such procedure as I have suggested for the discussion of purely scientific subjects, but would be averse to extending it to cover technological matters, and I must admit to having hesitated for some time before deciding to include technical as well as scientific problems in the field which my proposed Association is to consider.

I realize, of course, that the interchange of knowledge on purely scientific subjects is much freer than is the exchange of technical information which is apt to be regarded as the private property of him who possesses it and to be used for his own benefit rather than for that of the world at large.

It is the privilege of the aged to be allowed to repeat words they have used in days gone by, and I propose to take advantage of this privilege by quoting some words I used on this aspect of the subject when I took over the office of President of the Institute of Metals from my predecessor. "In industry", I said, "we compete with one another, nations compete one with the other more keenly every day. . . . Where we enter the realm of pure science nationality ceases to exist . . . and we can all work together untroubled by competition except for the advancement of our common cause, or by jealousy except of anything that may hinder the advancement of the art of which we are all . . . the servants".

That, Sir, was the truth, as I saw it, nearly twenty years ago. Neither statement seems so true to-day. As to the second, we all know that if we let our eyes stray round the horizon they will ultimately look in one direction in which they will not see scientists ready to collaborate with their colleagues in other lands, or concerned solely with the advancement of the branch of science of which they are said to be the servants.

On the other hand, we have had in recent years some remarkable instances of industrial collaboration on the most severely practical lines between the nationals of competing countries. I quote, as an example, the activities of the "Joint United States and Great Britain Productivity Committee" which among many similar enterprises has arranged for delegations of steel workers of all ranks to visit and study the operation of each other's steel works with a view to increasing the productivity of the analogous enterprises in their own country. This is only one of many examples that could be given of the much greater freedom which

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exists to-day in the interchange of technical knowledge, and therefore, Mr. President, I am not without hope that if you and your colleagues in this Society and in many of its sister societies throughout the world see fit to organize an International Metallurgical Association you will not exclude from the enjoyment of its benefits those whose task it is to apply the knowledge which others have secured for them.

The Association, as I visualize it, would be governed by a permanent Council. By that I do not, of course, mean that the composition of the Council would be unalterable, but that it should be in continuous existence and not formed and re-formed in preparation for each new conference. Only in this way, it seems to me, can the continuity I have postulated be assured, and to this element of continuity I attach great importance.

As to the composition of the Council, I think it must depend largely upon the extent of the support which such an Association would evoke. Where only one Society in a country became a member of the Association it would seem desirable for the Council of that Society to function as a local committee of the Council of the Association and to delegate one or more of its members to represent it on the latter. In countries in which a number of societies join the Association, a local committee could be formed consisting of representatives of each such Society, and that committee could delegate one or more of its members to represent it on the Council of the Association.

I have assumed that the Council would meet after each Conference in order to review the work done and to decide whether its subject should be further considered at the ensuing Conference or not. If not, it would be the task of the Council to decide what the subject for discussion at the next Conference should be and where it should be held.

As soon as these two questions were answered the assistance of the local committees would become all-important. The committee of the country which was to be the next host of the Association would, of course, be entrusted with the many tasks involved. All the committees would no doubt be asked to convey to the Council their local knowledge as to the extent to which the subject was being studied, or had been developed in their countries, and to put forward the names of those of their compatriots best able to present papers or to take part in the discussions and the special aspect of the subject to which they could best contribute.

With this and similar information before them the Council would, in due course, be able to formulate a programme for the coming Conference, laying down the sections into which it was to be divided and issuing the necessary invitations to those who were considered best able to prepare papers and to others who would initiate or take part in the discussions.

It seems clear that these activities would make it essential that the Association should have the services of a permanent paid secretariat.

This name must not be thought to imply the formation of a large staff of officials nor the securing of large premises in which to house them. It does, however, seem very important to me that such an Association as I have in mind should have a permanent Secretary, permanently lodged say in Paris or wherever may be thought desirable, who will not only function during the

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conferences but will carry on the work of the Association between the individual meetings. Such an officer need not necessarily be employed full time, indeed I doubt whether he could be, but that he should be always and continuously available seems to me to be essential. I do not think that the expenses entailed would be onerous, and certainly not beyond the means likely to be available for the purpose.

This brings me to the question of how the organization should be financed. It would seem that this should be effected in various ways. The permanent organization should, I suggest, be paid for by annual contributions from each of the participating societies. These contributions might be uniform, or it might be considered preferable that they should vary according to the membership of the Society. It might also be held desirable to have more than one scale of contribution, societies directly concerned with Metallurgy, such as your Society Mr. President and mine, paying at a higher rate than others less directly interested.

Individuals attending the conferences would, I assume, pay a contribution, as is customary, and their contribution would no doubt cover, in part, the cost of publishing the record of the proceedings. It is possible, however, that ultimately the participating Societies would undertake this latter duty on behalf of their members.

And so, Mr. President, I reach the end of the pleasant task allotted to me. I recognize the temerity of suggesting yet another international organization, and yet I am not without hope that if given the limited scope which I have described it may be longer lived than its predecessors and may fill a gap of which many of us have become conscious. May I conclude, as I began, by expressing my cordial thanks, this time to you and your colleagues for permitting me to address you, and may I include in my expression of thanks, my deep gratitude to Dr. Harold Moore who, as in so many cases in the past, has helped me most generously in the preparation of my thesis.

OTHER NEWS

FOUNDERS' COMPANY FELLOWSHIPS

The Worshipful Company of Founders of the City of London, believing that the development and progress of founding and the science of metallurgy must depend very largely on attracting to the industry highly trained men of evident talent, awards Fellowships so as to give facilities for advanced education to men who have already completed their normal course of training, at a University or elsewhere, to a high educational standard.

These "Founders Company Fellowships" are available to those candidates who appear likely to be able to make good their careers in the founding industry if afforded the facilities for further courses of specially designed study.

Fellows are chosen by a Selection Committee from among applicants who have completed such training as mentioned above, in chemistry, physics, metallurgy (more especially in connection with molten metal), and allied sciences. In addition to this, some

previous practical foundry training and experience, together with, if and when possible, the Diploma of the British Foundry School, would carry weight with the Selection Committee. At the same time the Committee pays considerable attention to the character and powers of initiative of the candidate.

The course to be followed by the Fellow will in each case be chosen with the object of adding to his scientific equipment that which appears to be most necessary for adapting him to some branch of the founding industry. There will be no limitation to the nature of the course which may be selected; it might include research or a period in works or foreign experience, due regard being paid to the particular wishes and aptitude of the Fellow.

The normal value of the Fellowship is £300 per annum, and it will be renewable for a second year and in special cases for a third year. One Fellowship is granted each year, so that in ordinary circumstances there are two Fellowships in existence.

The Fellow will be expected to devote his whole time to work approved by the Company and to submit periodical reports of progress, if required. No other work for which payment would be received shall be undertaken by him without the consent of the Master of the Company, and no other grant, scholarship, or fellowship shall be held concurrently with the Fellowship unless the Selection Committee approve.

Candidates should not be less than 21 years of age on 1 September of the year of application, and will be required to furnish particulars of their name, address, age, academic and/or other training, &c. They will subsequently be required to attend before the Selection Committee. The tenure of the Fellowship dates from 1 September.

Applications must be received not later than 1 May by the Clerk of the Worshipful Company of Founders, Founders' Hall, 13 St. Swithin's Lane, London, E.C.4, to whom all enquiries should be addressed.

DIARY FOR APRIL

THE INSTITUTE

MONDAY, 17 APRIL to FRIDAY, 21 APRIL

Students' Tour in Sheffield.

LOCAL SECTIONS MEETINGS

TUESDAY, 4 APRIL

London Local Section.—Dr. N. P. Allen opens discussion on "Creep". (4 Grosvenor Gardens, London, S.W.1, at 7 p.m.)

THURSDAY, 6 APRIL

Birmingham Local Section.—Annual General Meeting; Chairman's Address. (James Watt Memorial Institute, Great Charles Street, Birmingham, at 6.30 p.m.)

NEWS AND ANNOUNCEMENTS

OTHER MEETINGS

TUESDAY, 4 APRIL

Electrodepositors' Technical Society, Midlands Centre.—B. B. Winter and R. J. Brown open discussion on "What is Implied by Specification Plating". Joint meeting with the Institute of Mechanical Engineers (Automobile Division), Coventry Centre. (Geisha Café, Hertford Street, Coventry, at 7 p.m.)

WEDNESDAY, 5 APRIL

Institution of Production Engineers, Halifax Graduate Section.—G. L. Hart: "The Production of All-Metal Bus Bodies". (Huddersfield Technical College, at 7 p.m.)

Institution of Production Engineers, Manchester Graduate Section.—J. A. Richmond: "The Extrusion of Metals". (Reynolds Hall, College of Technology, Manchester, at 7.15 p.m.)

THURSDAY, 6 APRIL

British Glaciological Society.—Symposium on the Crystallization of Metals, Rocks, and Ice. (Royal Geographical Society, Kensington Gore, London, S.W.7, at 5 p.m.)

SATURDAY, 15 APRIL

Swansea and District Metallurgical Society.—Annual General Meeting, followed by a Film on Chain-Making. (Central Library, Swansea, at 6.30 p.m.)

TUESDAY, 18 APRIL

Institution of Electrical Engineers, Measurements Section.—J. A. Hall and C. R. Barber open discussion on "Temperature Measurement". (Savoy Place, London, W.C.2, at 5.30 p.m.)

WEDNESDAY, 19 APRIL

Institution of Production Engineers, Luton Graduate Section.—C. A. J. Taylor: "Surface Coatings and Finishes". (Small Assembly Room, Luton Town Hall, at 7.30 p.m.)

WEDNESDAY, 19 APRIL, TO SATURDAY, 22 APRIL

Electrodepositors' Technical Society.—Silver Jubilee Conference. (Grand Hotel, Eastbourne.)

THURSDAY, 20 APRIL

Institution of Electrical Engineers, Irish Branch.—G. H. Burnell: "The Works Chemist-Metallurgist and his Technique". (Trinity College, Dublin, at 6 p.m.)

Institution of Mining and Metallurgy.—General Meeting. (Geological Society, Burlington House, Piccadilly, London, W.1, at 5.0 p.m.)

WEDNESDAY, 26 APRIL

Iron and Steel Institute.—James Mitchell: "Sidney Gilchrist Thomas Centenary Lecture". (4 Grosvenor Gardens, London, S.W.1.)

NEWS AND ANNOUNCEMENTS

WEDNESDAY and THURSDAY, 26 and 27 APRIL

Iron and Steel Institute.—Annual General Meeting. (4 Grosvenor Gardens, London, S.W.1.)

THURSDAY, 27 APRIL

Liverpool Metallurgical Society.—Visit to the Works of British Insulated Callenders Cables, Ltd., Prescot, at 3 p.m.

FRIDAY, 28 APRIL

Electrodepositors' Technical Society, Sheffield and North-East Centre.—F. G. Furniss: "The Economic and Other Advantages of Metal Rectifiers for the Electroplating Industry". (Grand Hotel, Sheffield, at 6.30 p.m.)

Institution of Mechanical Engineers, Applied Mechanics Group.—Rodney Hill: "Relations between Roll-Force, Torque, and the Applied Tensions in Strip Rolling"; and D. R. Bland: "A Theoretical Investigation of Roll Flattening". (Storey's Gate, St. James's Park, London, S.W.1, at 5.30 p.m.)

APPOINTMENTS VACANT

ENGINEER or PHYSICIST required for high-temperature mechanical testing section of Sheffield steelworks research laboratories. Box No. 291, Institute of Metals, 4 Grosvenor Gardens, London, S.W.1.

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THE INSTITUTE OF METALS
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Publication of the Centre National de la Recherche Scientifique, France

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April 1950.

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INSTITUTE NEWS AND ANNOUNCEMENTS

W. H. A. ROBERTSON MEDAL

The first award of the W. H. A. Robertson Medal has been made to Mr. W. J. THOMAS and Mr. W. A. FOWLER for their paper on "Some Technical Problems Influencing Production Economy in the Rolling of Aluminium", published in the *Journal*, 1949, vol. 75, pp. 921-948. The authors are Assistant Managing Director and Production Manager (Manufactured Materials), respectively, of The British Aluminium Co., Ltd.

The W. H. A. Robertson Medal will be awarded annually by the Council of the Institute of Metals to the author or authors of the paper adjudged to be of the highest merit contributed to the *Journal of the Institute of Metals* on engineering aspects of non-ferrous metallurgy. Photographs of the medal, and some descriptive matter, will be found in the News Section (pp. 142-145) of the May 1949 issue of the *Journal*.

METALLURGICAL ENGINEERING COMMITTEE

The following have accepted invitations to serve on the Metallurgical Engineering Committee, which is expected to take active steps during the present year to stimulate interest in the subjects for which it is responsible :

Mr. D. F. CAMPBELL (*Chairman*).

Major C. J. P. BALL.

Mr. W. H. BOWMAN.

Mr. C. E. DAVIES.

Mr. H. J. MILLER.

Mr. D. P. C. NEAVE.

Mr. C. G. ROBINSON.

Mr. CHRISTOPHER SMITH.

Sir ARTHUR SMOUT.

Dr. N. SWINDELLS.

Mr. W. J. THOMAS.

Mr. B. N. H. THORNELY.

Ex-officio :

The President.

Chairman, Publication Committee.

NEWS AND ANNOUNCEMENTS

The terms of reference of the Committee are (i) to develop interest in metallurgical engineering in the non-ferrous metal industry and to promote the study of equipment and instruments used in the industrial melting, casting, and working of non-ferrous materials; (ii) to make recommendations to the Council regarding the need for holding special meetings, discussions, or symposia; inviting papers or articles for publication; or the publication of books or other literature to attain the objects for which the Committee was formed; (iii) to make suggestions to the appropriate Committees of the Institute in connection with the organization of special meetings or the production of publications approved by the Council on its recommendation.

MONOGRAPH NO. 7: CORRIGENDA

Will members who have received a copy of Monograph No. 7, "The Solidification of Castings", by R. W. Ruddle, please note the following points:

In Fig. 37 (p. 78) the ordinate should bear the same description as that of Fig. 36 (p. 77), namely: Inches from steel-chill interface.

In Figs. 38 and 39 (pp. 79 and 80) the description on the ordinate should read Temperature, ° F. *not* Temperature, ° C.

PERSONALITIES

New Honorary Corresponding Members to the Council

PROFESSOR A. G. E. HULTGREN (Sweden)

Professor Axel Gustaf Emanuel Hultgren was born in 1886 at Förlösa, Sweden, and graduated as a metallurgical engineer from the Royal Institute of Technology, Stockholm, in 1908. After various appointments, partly as a teacher, he was made Assistant in the Government Testing Institute, Stockholm; from 1915 to 1925 he was Chief of Research and Heat-Treatment, SKF Ball Bearing Co., Gothenburg, and from 1926 to 1932, Chief of Research, Söderfors Steelworks, Sweden. Since 1934 he has been at the Royal Institute of Technology, Stockholm, first as Instructor in Metallography and since 1938 as Professor of Metallography. Since 1932 he has also engaged in practice as a consultant.

Professor Hultgren has taken out about 30 patents and published about 40



NEWS AND ANNOUNCEMENTS

papers in scientific and technical journals, mostly on steels. His main research interests cover: (1) the microstructure and properties of steels after various heat-treatments, and their mechanisms of transformation; (2) mechanisms of freezing and segregation in steel ingots, killed and rimmed; (3) formation of non-metallic inclusions in steel; (4) hardness testing; and (5) heat-treatment processes.

Professor Hultgren was elected a member of the Swedish Academy of Engineering Sciences in 1930 and a member of the Royal Swedish Academy of Science in 1945. He has been a member of the Institute of Metals since 1921.

Among the honours Professor Hultgren has received are the Arnberg Award of the Royal Swedish Academy of Science (1929), the Rinman Medal of Jernkontoret (1940), and (jointly with the late Professor G. Phragmén) the Robert W. Hunt Medal of the American Institute of Mining and Metallurgical Engineers.

PROFESSOR R. F. MEHL (U.S.A.)

Professor Robert Franklin Mehl was born at Lancaster, Pa., in 1898. He was educated at Franklin and Marshall College, Lancaster, Pa., where he graduated B.S. in 1919, and Princeton University (Ph.D., 1924).

On leaving Princeton he was successively Head of the Department of Chemistry, Juniata College (1923-1925), National Research Fellow at Harvard University (1925-1927), Superintendent of the Division of Physical Metallurgy, Naval Research Laboratory, Washington, D.C. (1927-1931), and Assistant Director, Research Laboratories, The American Rolling Mill Company, Middletown, O. (1931-1932). In 1932 he was appointed Director of the Metals Research Laboratory and Professor of Metallurgy at the Carnegie Institute of Technology, Pittsburgh, Pa., and in 1935 was also made Head of the Department of Metallurgical Engineering. These positions he still holds. He has served as consultant to many American companies, and has acted as consultant and court expert in various patent trials.

Professor Mehl has published about 100 papers on a wide range of metallurgical subjects, and he is the editor of the Metallurgy and Metallurgical Engineering Series of text-books published by the McGraw-Hill Book Co., Inc. He was the translator of Professor Gustav Tammann's book "The States of Aggregation" ("Aggregatzustände") (D. Van Nostrand Company, 1925) and the author of "Metallurgy of Iron and Steel" (published in Portuguese in São Paulo, Brazil, in 1944) and "History of Physical Metallurgy" (American Institute of Mining and Metallurgical Engineers, 1947).

Professor Mehl is a member of numerous technical and scientific societies and a member of many committees. He is chairman of the Metallurgical Education Advisory Committee of the American Society for Metals; the Metallurgical Engineering Education Committee of the American Society for Engineering Education; and the Metallurgy Panel, Research and Development Board, National Military Establishment, Washington, D.C.

Among the honours he has received are the Prize certificate for the best scientific papers published in Transactions of the Institute of Metals Division of the American Institute of Min-



ing and Metallurgical Engineers (1934, 1939, 1943, 1944, 1947); the John Scott Medal, certificate, and prize award for the development of gamma-ray radiography (1934); the Howe Medal of the American Society for Metals (1939); Medallist of the American Industrial Radium and X-Ray Society (1943); Medallist of the Associação Brasileira de Metais (1944); and the James Douglas Gold Medal of the American Institute of Mining and Metallurgical Engineers (1945). He has delivered numerous special lectures to scientific societies, including the Annual Institute of Metals Lecture of the American Institute of Mining and Metallurgical Engineers (1936); Twelfth

Annual Priestley Lectures (five) at the Pennsylvania State College (1938); Campbell Lecture of the American Society for Metals (1941); Sauveur Lecture of the American Society for Metals (1940 and 1943); Special Lectures at the Universidade de São Paulo, Brazil (1943 and 1949); and the Hatfield Memorial Lecture of the Iron and Steel Institute, London (1948).

Professor Mehl has been the recipient of honorary doctorates from Franklin and Marshall College (1938), the Universidade de São Paulo, Brazil (1944); and Stevens Institute of Technology (1944). He was elected a member of the Institute of Metals in 1934.

PROFESSOR J. ORLAND (Spain)

Professor Joaquín Orland was born at Albay, Philippines, in 1888, of Spanish parentage. Since 1892, however, he has lived in Spain. In 1902 he joined the Jesuit order, and obtained the degree of Master of Arts in 1908 at the University of Granada. From 1911 to 1917 he was Professor of Mathematical Analysis and Chemistry in the Instituto



Católico de Artes e Industrias, Madrid. He received the degree of Master of Science (Physics) from the University of Madrid in 1918, and the degrees of Doctor of Philosophy and Doctor of Divinity from Sarriá (Barcelona) in 1922. Since 1923 he has been Professor and Head of the Department of Strength of Materials and Metallography in the Instituto Católico de Artes e Industrias at Madrid.

Professor Orland has published numerous articles on metallographic subjects in the journal *Anales de Mecánica y Electricidad*, published by the graduates of the I.C.A.I. (Instituto Católico de Artes e Industrias), in *Metalurgia y Electricidad*, *Ciencias*, and other Spanish journals. Recently he published, with Sr. Julio Garrido, a book entitled "Los Rayos X y la Estructura Fina de los Cristales" ("X-Rays and the Fine Structure of Crystals").

Professor Orland has been a member of the Real Sociedad Matemática Española since 1911; of the Real Sociedad Española de Física y Química since 1940; of the Asociación Técnica Española de Estudios Metalúrgicos, Barcelona, since 1944; and of the Instituto del Hierro y del Acero, Madrid, since 1947. He was elected a member of the Institute of Metals, and also of the Iron and Steel Institute, in 1927.

DR. R. A. WILKINS
(U.S.A.)

Dr. Richard A. Wilkins was born in Massachusetts, in 1896, and graduated in Chemical Engineering from the Massachusetts Institute of Technology in 1918.

During the First World War he was in command of the Laboratory of the Offence Section, Development Division, Chemical Warfare Service. Subsequently, Dr. Wilkins was Chemical Engineer in the Lynite Laboratories, Cleveland, O.; Assistant Professor of Chemical Engineering, Massachusetts Institute of Technology; and Vice-President, Industrial Development Corporation. In 1930 he joined Revere Copper and Brass, Inc., as Metallurgical Manager, later becoming Vice-President and Director of Research.

Dr. Wilkins is the author or co-author of many technical papers dealing with copper and brass and various metallurgical operations, and in 1943 he published, with Mr. E. S. Bunn, the well-known book "Copper and Copper-Base Alloys". He has been a member of the Institute of Metals since 1935.



DISCUSSION OF PAPERS

In order to assist the Committee responsible for arranging the programmes of the General Meetings of the Institute, will all members who are prepared to discuss orally any of the papers published in the *Journal* please inform the Secretary as soon as possible.

It is hoped that such information will enable programmes to be arranged which will secure well-attended and lively discussions.

PERSONAL NOTES

PROFESSOR E. N. DA C. ANDRADE has been appointed Professor Emeritus of Physics at University College, where he was Professor of Physics from 1928 to 1949.

DR. S. BHATTACHARYA has left the Department of Metallurgy at Manchester University, where he has been engaged in research for some time past, and has returned to India.

SIR LAWRENCE BRAGG is to receive the honorary degree of Doctor of Civil Law of Durham University on 24 May.

MR. L. R. CARR, Director of Research, John Dale, Ltd., was elected Member of Parliament for the Mitcham Division in the recent General Election.

MR. A. K. CHATTERJEE has been appointed metallurgist with the Metal Corporation of India, Ltd.

MR. S. N. CHATTERJEE has been awarded the degree of B.Sc. (Engineering Metallurgy) by London University and is now with Messrs. Stewart and Lloyds, Ltd., Corby.

MR. P. CLARK has left Messrs. Thomas Bolton and Sons, Ltd., Widnes, and is now employed by the Anglo-Iranian Oil Co., Ltd., Abadan.

DR. S. F. DOREY was, on 17 March, elected President of the Institution of Mechanical Engineers.

MR. L. G. EARLE has been transferred to the Melton Works of Messrs. Capper Pass and Son, Ltd., at North Ferriby, near Hull.

MR. M. J. FOX is now employed as a metallurgist by B.K.L. Alloys, Ltd., Birmingham.

MR. FRANK HUDSON, of The Mond Nickel Company, Ltd., is the leader of the Brassfoundry Productivity Team which left recently to study conditions in the United States. The Team, which was formed under the auspices of the National Brassfoundry Association and the Association of Bronze and Brass Founders, consists of 16 members and expects to be away for about two months.

MR. E. C. MANTLE, of the British Non-Ferrous Metals Research Association, is a member of the Brassfoundry Productivity Team referred to above.

NEWS AND ANNOUNCEMENTS

PROFESSOR R. F. MEHL has been appointed a member at large of the National Research Council of the U.S. National Academy of Sciences.

MR. J. A. S. MOWAT has obtained a post in the Ministry of Supply, Division of Atomic Energy.

DR. A. G. QUARRELL, research manager to the British Non-Ferrous Metals Research Association, has been appointed head of the Postgraduate School of Physical Metallurgy recently established at Sheffield University. He will take up his new duties in October.

MR. J. P. SUTCLIFFE has recently taken up a position as mill superintendent at the works of Noranda Copper and Brass, Ltd., Montreal East, P.Q.

DEATH

The Editor regrets to announce the death of :

DR. HORACE WADSWORTH GILLETT at Nicholasville, Ky., on 3 March. Dr. Gillett, who was 66 years of age, was first director of the Battelle Memorial Institute, Columbus, O., from 1929 to 1934, and retired from the position of chief technical adviser to the Institute last year. He had been a member of the Institute of Metals since 1910.

LETTERS TO THE EDITOR

"THE LIGHT METALS INDUSTRY"

SIR,

A reviewer is in a position of privilege, but it should be clear that this fact lays upon him certain responsibilities. It is for this reason only, as a point of principle, that I (a non-member of the Institute) venture to ask for the courtesy of a little space in your columns to make one or two comments on Mr. Chadwick's review of my recent book "The Light Metals Industry" in your January issue.

The chief responsibility of a reviewer is to take a book for what it is and not for what he thinks it should have been. Mr. Chadwick misrepresents my book and confuses its intention—and achievement, if my many other competent reviewers and correspondents are to be trusted—when he criticizes it as a handbook, which it makes no claim to be. I have clearly stated that it is meant not as one more text-book on light metals, but as a progress report on the *industry* which attempts to give a critical appraisal of its present position, with my own interpretations of the reasons for this. His suggestion that the subject matter should be "vetted" by the industrial interests or "representative official bodies" not only shows that he has completely missed its point, but is also strangely at variance with the spirit of the research outlook which Mr. Chadwick should represent. Or does the blackened Midlands atmosphere obscure that outlook as much as it apparently disinclines certain of its subjects to like fresh air? At least I have not found this "blinker" attitude in the reception my small book is having in the older Universities and in the more lively quarters of the industry in which I have spent more than 20 years of my professional life.

There are, I acknowledge with regret, a "few (technical) errors for the pundits to seize upon" as one of my reviewers has put it,

NEWS AND ANNOUNCEMENTS

but Mr. Chadwick has not been particularly fortunate in his selection or penetrating in the thought he bestows upon the three examples he pillories as typical, in his careless generalization, of my "serious omissions and errors". A moment's reflection and more care in reading would have helped him to see two of them in a different light.

Finally, I would suggest that ill-considered prophecies of the type Mr. Chadwick makes about beryllium are as irrelevant in a review of a book as they are completely out of place in a serious scientific journal.

Yours faithfully,

WINIFRED LEWIS.

Oxford.

February 1950.

SIR,

The author of a book, too, has responsibilities, at least as great as those of the reviewer, and the first is to take every possible step to ensure the accuracy of the information presented.

I am sorry, therefore, that Miss Lewis should resent my criticisms of this particular aspect of her book "The Light Metals Industry", for while it may be true that the book is intended to be a critical appraisal of the industry, it is in point of fact much more than that, since it describes in some detail the technological processes involved in the industry from the mining of the ore to the finished product, and embraces both in the text and in the tables and diagrams a great amount of factual information on every aspect of light alloy metallurgy. One cannot therefore argue, as Miss Lewis seems to imply, that this information is merely introduced to illustrate the argument, for the reader may well attempt to make use of it.

Indeed, to quote from a reviewer whose opinions I understand are acceptable to the author "To many readers in the metallurgical and engineering industries the most important parts of the book may well be the full statistics, &c. . . ." and although, as the reviewer goes on to say, "the technical reader will not be misled by the few inaccuracies", I would contend that many readers of this book will not be in a position to detect inaccuracies and may well therefore be misled, especially since the inaccuracies are by no means few in number.

I would have thought that the "spirit of the research outlook" would have been to seek information, advice, and criticism from whatever sources were available, a course which I would have regarded as the normal one in writing a book with so wide a scope; for how can one author, writing as she states in a period of convalescence, possibly have accurate and up-to-date knowledge of the many aspects of so immense an industry? The "blinkers" attitude is surely to be found in the author's rejection of sources of data which would have added immensely to the value of the publication.

Finally, I am unrepentant in regarding the inclusion of beryllium in "The Light Metals Industry" as both unrealistic and pedantic, and I feel sure that this chapter can have little appeal to the average reader of Miss Lewis's book.

Yours faithfully,

R. CHADWICK.

Birmingham.

March 1950.

NEWS OF LOCAL SECTIONS AND ASSOCIATED SOCIETIES

LONDON LOCAL SECTION

At a meeting held at 4 Grosvenor Gardens, S.W.1, on 9 March, MR. R. J. L. EBORALL gave a lecture on

Some Aspects of Recrystallization.

The early history of the study of recrystallization was traced, and illustrations were given of characteristic grain structures obtained at various stages of the different processes involved. Carpenter and Elam showed in 1921 that all the usually-recognized recrystallization and grain-growth phenomena proceeded through the growth of some grains at the expense of others by the migration of the grain boundaries. The rates of formation of crystal nuclei and growth of new crystals during primary recrystallization had been measured by Mehl and his collaborators, and consideration of the observed linear-growth velocities had led Mott and Burgers to point out that the growth could not proceed atom by atom but must involve the rearrangement of groups of atoms. Three distinct theories of growth by these authors were outlined.

None of these appeared to explain readily the large differences, depending on the relative orientation of the adjacent grains, between the mobilities of different boundaries. These differences appeared to be mainly responsible for the characteristic textures developed in both secondary and primary recrystallization, although for the latter Burgers and Louwerse had originally explained the textures as being the result of the mechanism of nucleation. It appeared likely, however, that nucleation did take place by a modification of the Burgers mechanism.

SOUTH WALES LOCAL SECTION

At a meeting held at University College, Swansea, on 14 March, MR. F. C. ASHEN gave a lecture entitled

Fuel Utilization in the Non-Ferrous Metal Industry.

The lecturer analysed the fuel consumption of a cross-section of the industry to reveal the factors influencing efficient fuel utilization. All forms of fuel and power were calculated back to raw coal or its equivalent, as a common basis for division into categories of usage.

The economics in raw coal and production costs were considered for alternative fuels, i.e. electricity, producer gas, town's gas, oil and raw coal, for melting, preheating, and annealing.

Particular attention was paid to the fundamental principles governing rates and conditions of heat transfer inside metallurgical furnaces. The utilization of the faster rate of heat release from town's gas concentrated combustion burners was illustrated by applications with very high thermal efficiencies, and the possible application of the new development of Downjet combustion by the British Coal Utilization Research Association was also examined for reverberatory-type melting furnaces.

NEWS AND ANNOUNCEMENTS

The quantity of basic coal required to produce a ton of mixed non-ferrous products, i.e. strip, sheets, rods, tubes, heavy plates, &c., was said to vary between 30 and 40 cwt. per ton during the past eight years, the variation depending on the state of production activity and types of material.

DIARY FOR MAY

THE INSTITUTE

WEDNESDAY, 10 MAY

May Lecture.—Dr. H. Roxbee Cox: "Industrial Gas Turbines". (The Royal Institution, 21 Albemarle Street, London, W.1, at 6 p.m.)

LOCAL SECTION MEETING

TUESDAY, 2 MAY

South Wales Local Section.—Brigadier J. Gwynne Morgan: "Medical Aspects of Nickel Refining". (Metallurgical Department, University College, Singleton Park, Swansea, at 6.30 p.m.)

APPOINTMENTS VACANT AND REQUIRED

METALLURGIST. City-and-Guilds cert., age 33 yrs. Knowledge & exp. of chem. anal., plating, fault invest., and gen. works control. Trained toolmaker with mech. des. exp. (patentee). Specialized exp. of furnace brazing, which includes heat-treatable light-gauge Al alloys. Applicant desires post with good prosps. Box No. 295, Institute of Metals, 4 Grosvenor Gardens, London, S.W.1.

METALLURGIST required for process control, with opportunity for promotion to Works Manager. Age 30–35. Qualifications: Degree or A.I.M., or higher diploma; knowledge and experience of casting, rolling, extrusion, and drawing of brasses, copper, and bronzes. The salary will be very attractive to the right man, who should apply in writing only to: Sharp, Parsons & Co. (Reference T.W.S.), Chartered Accountants, 120 Colmore Row, Birmingham 3. Applications will be regarded as confidential documents.

THE BRITISH IRON AND [STEEL] RESEARCH ASSOCIATION. The above Association is offering a bursary for post-graduate research in the constitution of certain alloys. The bursary will be tenable at the Inorganic Chemistry Laboratory of Oxford University and will be under the supervision of Dr. W. Hume-Rothery, F.R.S. Applicants should have, or the expectation of, a good honours degree in Metallurgy, Physics, or Physical Chemistry. The value of the bursary is £250–£300 p.a., according to age, qualifications, and residence. Period of tenure will be normally for two years, commencing October 1949, but may be extended as necessary to complete the research, which is intended to lead to a higher degree.

Written applications only to the Personnel Officer, British Iron and Steel Research Association, 11 Park Lane, London, W.1.

THE IMPERIAL SMELTING CORPORATION, LTD., require a metallurgist to direct the work of a group of technicians engaged on research into extraction of zinc and allied metals. Must have at least 1st Class Hons. degree in metallurgy and preferably higher qualifications. Some years' industrial experience and the ability to direct and supervise the work of others essential. Salary in accordance with qualifications and experience. Forms of application may be obtained from: Manager, Personnel Department, Imperial Smelting Corporation, Ltd., Avonmouth, Bristol. Please quote Ref. IM/GLM.

THE INSTITUTE OF METALS

President :

H. S. TASKER, Esq., B.A.

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Editor :

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Major R. E. MOORE

Administrative and Editorial Offices:

4 GROSVENOR GARDENS, LONDON, S.W.1

Telephone :

SLOANE 5928 & 6233

INSTITUTE NEWS AND ANNOUNCEMENTS

**AUTUMN MEETING, BOURNEMOUTH, MONDAY TO
FRIDAY, 18-22 SEPTEMBER 1950**

PROVISIONAL PROGRAMME

The Autumn Meeting of the Institute will be held in Bournemouth from Monday to Friday, 18-22 September (not Tuesday to Friday, 19-22 September, as previously announced). It is hoped that there will be a large attendance.

Members who intend to be present are strongly advised to book their hotel accommodation at an early date. A list of A.A. appointed hotels located near to the place of meeting is given below.

The Autumn Lecture will be delivered on the evening of Monday, 18 September, by Dr. E. E. Schumacher, Chief Metallurgist of the Bell Telephone Laboratories, Inc., Murray Hill, N.J., U.S.A. It is particularly hoped that members will make arrangements to arrive in Bournemouth in time for this important occasion, to do honour to this eminent American scientist, who is coming to England by special invitation of the Council.

Monday, 18 September

10.0 a.m.—Secretary's office open for registration.

11.0 a.m.—Day tour to Southampton and area ; lunch at Southampton ; visits to works, laboratories, &c., in the Southampton area ; return to Bournemouth in time for :

6.0 p.m.—Autumn Lecture, by Dr. E. E. SCHUMACHER, Chief Metallurgist, Bell Telephone Laboratories, Inc., Murray Hill, N.J., U.S.A. (Lecture in the School Hall, Bournemouth School for Girls, Gervis Road.)

Tuesday, 19 September

10.0 a.m.—General Meeting at St. Peter's Hall, Hinton Road. Welcome by His Worship the Mayor of Bournemouth. Official business.

10.30 a.m.—Presentation and discussion of papers :

(a) *Jointly* : SLATER, KENWORTHY, and MAY, "Corrosion and Related Problems in Sea-Water Cooling and Pipe Systems in H.M. Ships" (*Journal*, 1950, June) ; ROGERS,



Aerial View of Bournemouth.

NEWS AND ANNOUNCEMENTS

"A Method for Assessing the Relative Corrosion Behaviour of Different Sea-Waters" (*Journal*, 1950, Feb.); MAY and DE VERE STACPOOLE, "The Jet-Impingement Apparatus for the Assessment of Corrosion by Moving Sea-Water" (*Journal*, 1950, June); and CAMPBELL, "Pitting Corrosion in Copper Water Pipes Caused by Films of Carbonaceous Material Produced during Manufacture" (*Journal*, 1950, June).

11.30 a.m.—(b) *Jointly*: PERRYMAN and HADDEN, "Stress-Corrosion of Aluminium-7% Magnesium Alloy"; GILBERT and HADDEN, "A Theory of the Mechanism of Stress-Corrosion in Aluminium-7% Magnesium Alloy"; and PERRYMAN and BLADE, "Relationship Between the Ageing and Stress-Corrosion Properties of Aluminium-Zinc Alloys" (*Journal*, 1950, May).

2.30 p.m.—Short tour of the Isle of Purbeck, including Corfe Castle and Lulworth.

8.0 p.m.—Reception and dance at the Pavilion, by invitation of His Worship the Mayor of Bournemouth.

Wednesday, 20 September

10.0 a.m.—General Meeting at St. Peter's Hall, Hinton Road. Presentation and discussion of papers:

(a) *Jointly*: COTTRELL and AYTEKIN, "The Flow of Zinc under Constant Stress" (*Journal*, 1950, July); WOOD and SCRUTTON, "Mechanism of Primary Creep in Metals" (*Journal*, 1950, July); WOOD and DEWSNAP, "Atomic Displacements Associated with Elasticity in Plastically-Deformed Metals" (*Journal*, 1950, March); CALNAN and BURNS, "Some X-Ray Observations on the Nature of Creep Deformation in Polycrystalline Aluminium" (*Journal*, 1950, July); and GREENOUGH and SMITH, "The Mechanism of Creep as Revealed by X-Rays" (*Journal*, 1950, July).

11.30 a.m.—(b) THORLEY, "The Calculation of the Activation Energies of Recovery and Recrystallization from Hardness Measurements on Copper" (*Journal*, 1950, April).

10.30 a.m.—Ladies' visit.

2.30 p.m.—Visits to works, laboratories, &c., in the vicinity of Bournemouth.

7.30 p.m.—Supper-Dance at the Royal Bath Hotel, at which His Worship the Mayor of Bournemouth will be the guest of the Institute.

Thursday, 21 September

10.0 a.m.—General Meeting at St. Peter's Hall, Hinton Road.

Presentation and discussion of papers:

(a) A paper to be invited or selected.

11.15 a.m.—(b) DAVIS and HOLMES, "The Pressure-Welding Characteristics of Some Copper-Base Alloys" (*Journal*, 1950, May).

12.30 p.m.—Conclusion of scientific sessions.

Afternoon.—Free, or

Golf meeting, if sufficient members are interested.

Evening.—(a) Symphony Concert by the Municipal Orchestra;
or

NEWS AND ANNOUNCEMENTS



Central Gardens, Bournemouth.



The Bay, looking East.

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(b) Informal discussion on subjects selected by the Metal Physics Committee. (Members interested are requested to suggest subjects for discussion.)

Friday, 22 September

9.30 a.m.—All-day tour to Cheddar Gorge, the Caves, and Wells Cathedral. Lunch at Wells; tea at Yeovil. Return about 7 p.m.

Hotels

There are very numerous hotels, boarding houses, &c., at Bournemouth, and a printed list, giving prices, may be obtained on application to the Secretary. As Bournemouth is a popular resort for the Autumn, and as other conferences are being held there when the Institute's meeting takes place, members are urged to reserve their rooms early. Few Bournemouth hotels will accept guests on bed-and-breakfast terms, so it is assumed that members will book on an inclusive weekly or daily basis. That being the case, no informal lunches are being arranged during this meeting.

Direct application must be made to the hotels for accommodation; hotels are not prepared to grant the Institute block bookings in connection with the meeting.

A selection of A.A. appointed hotels situated conveniently to the place of meeting is given below, with terms for full board per week:

(a) *Licensed Hotels* (A.A. Appointed):

- ****Carlton, East Cliff. (Tel. Bth. 6560.) Facing sea. 10 to 17 gns.
- ****Grand, Fir Vale Rd. (Tel. Bth. 7088.) Central. 11 gns. to £12 5s.
- ****Highcliffe, West Cliff. (Tel. Bth. 7210.) Facing sea. 10 to 14 gns.
- ****Imperial, The Lansdowne. (Tel. Bth. 1529.) Fairly central. £12 5s. to 15 gns.
- ****Norfolk, Richmond Hill. (Tel. Bth. 7272.) Central. 13 to 16 gns.
- ****Palace Court, Westover Rd. (Tel. Bth. 7100.) Central. 11 gns. to £17 10s.
- ****Royal Bath, Bath Rd. (Tel. Bth. 5555.) Facing sea. £12 5s. to £19 5s.
- ***Heathlands, Grove Rd. (Tel. Bth. 6350.) Behind East Cliff. 9 to 10 gns.
- ***Royal Exeter, Exeter Rd. (Tel. Bth. 6920.) Central. £11 os. 6d. to £13 2s. 6d.
- ***Savoy, West Cliff. (Tel. Bth. 2150.) Facing sea. 9 to 14 gns.
- Miramar, East Overcliff Drive. (Tel. Bth. 1081.) Facing sea. 10 to 14 gns.

(b) *Unlicensed Hotels and Boarding Houses* (A.A. Appointed):

- Addiscombe, Cranbourne Rd. (Tel. Bth. 4168.) 7½ to 8 gns.
- Belvedere, Bath Rd. (Tel. Bth. 1080.) Central. From 7 gns.
- Durley Hall, Durley Chine Rd. (Tel. Bth. 4646.) 10 to 12 gns.
- Empress, The Square. (Tel. Bth. 1576.) Central. 7 to 8½ gns.
- Glendevon, West Hill Rd. (Tel. Bth. 600.) 6 to 8 gns.

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- Glenroy Hall, St. Michael's Rd. (Tel. Bth. 5698.) Central.
7 to 9 gns.
***Hazelwood, Christchurch Rd. (Tel. Bth. 1066.) 8 to 10 gns.
***Melford Hall, St. Peter's Rd. (Tel. Bth. 1516.) Central.
7½ to 8 gns.
**Meyrick Court, 24 Christchurch Rd. (Tel. Bth. 1776.) 6 to
9 gns.
Redroofs, Bath Rd. (Tel. Bth. 4091.) Central. 8 to 9 gns.
Torbay, Upper Terrace Rd. (Tel. Bth. 5792.) Central. 7 to
8 gns.
***Westminster Hall, Beacon Rd. (Tel. Bth. 1559.) 7 to 9 gns.
Wimbledon Hall, Derby Rd. (Tel. Bth. 886.) 6 to 8 gns.

MEMORANDUM OF ASSOCIATION

The following special resolution was passed at an Extraordinary General Meeting held at the Café Royal, Regent Street, London, W.1, on Wednesday, 29 March 1950, at 10 a.m.:

That the provisions of Clause 3 of the Memorandum of Association of the Institute of Metals with respect to the objects of the Association be altered as follows:

By the omission from sub-clause (b) thereof of the words "and to assist the progress of inventions likely to be useful to the members of the Association and to the community at large".

By the omission therefrom of sub-clauses (c) and (k).

By the omission from sub-clause (d) thereof of the words "and between members of the Association" and the words "wholly or in part".

By the omission from sub-clause (g) thereof of the words "and deal with".

By the substitution in sub-clause (i) thereof of the words "tending to promote the objects of the Association", for the words "the undertaking whereof may seem desirable".

By the substitution in sub-clause (m) thereof of the words "services rendered to the science and practice of non-ferrous metallurgy", for the words "research, for inventions of a specified character, or for improvements in the production or manufacture of non-ferrous metals and their alloys, and to expend money in researches and experiments, and in such other ways as may extend the knowledge of non-ferrous metals and their alloys".

DISCUSSION OF PAPERS

In order to assist the Committee responsible for arranging the programmes of the General Meetings of the Institute, will all members who are prepared to discuss orally any of the papers published in the *Journal* please inform the Secretary as soon as possible.

It is hoped that such information will enable programmes to be arranged which will secure well-attended and lively discussions.

NEWS AND ANNOUNCEMENTS

COUNCIL 1950-51

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Tasker, H. S., B.A., Chairman, Goodlass Wall and Lead Industries, Ltd., London ; Chairman, British Titan Products Co., Ltd., Billingham ; Director, Basinghall Mining Syndicate, Ltd., London ; Director, Durex Abrasives, Ltd., Birmingham.

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Smout, Sir Arthur, J.P., F.R.I.C., M.I.M.M., F.I.M., Director, Imperial Chemical Industries, Ltd., London ; Director, Murex, Ltd., Rainham ; Director, Murex Welding Processes, Ltd. ; Director, Magnesium Elektron, Ltd., Manchester ; Director, Pyrotenax, Ltd., Hebburn-on-Tyne.

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Dorey, S. F., C.B.E., D.Sc., Wh.Ex., M.I.Mech.E., F.R.S., Chief Engineer Surveyor, Lloyd's Register of Shipping, London.

Murphy, Professor A. J., M.Sc., F.I.M., Professor of Industrial Metallurgy, University of Birmingham. (*Senior Vice-President*.)

O'Neill, Professor H., D.Sc., M.Met., F.I.M., Professor of Metallurgy, University College of Swansea, University of Wales.

Smithells, C. J., M.C., D.Sc., F.I.M., Director of Research, The British Aluminium Co., Ltd., Gerrards Cross.

Thompson, Professor F. C., D.Met., M.Sc., F.I.M., Professor of Metallurgy, Manchester University.

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Ordinary Members of Council :

Arnott, J., F.R.I.C., F.I.M., Chief Metallurgist, G. and J. Weir, Ltd., Glasgow.

Bailey, G. L., M.Sc., F.I.M., Director, British Non-Ferrous Metals Research Association, London.

Bolton, E. A., M.Sc., F.I.M., Factory Manager, Elliott Works, Imperial Chemical Industries, Ltd., Metals Division, Birmingham.

NEWS AND ANNOUNCEMENTS

Campbell, D. F., M.A., A.R.S.M., M.I.E.E., M.I.M.M., F.I.M., Chairman, Electric Furnace Co., Ltd., Weybridge; Chairman, Electro-Chemical Engineering Co., Ltd., Weybridge; Chairman, Davy and United Engineering Co., Ltd., Sheffield; Chairman, Metallurgical Equipment Export Co., Ltd., London; Chairman, Campbell and Gifford, Ltd., Weybridge.

Cook, Maurice, D.Sc., Ph.D., F.I.M., Director, Metals Division, Imperial Chemical Industries, Ltd., Birmingham.

Davies, Harry, F.I.M., Technical Manager, Imperial Chemical Industries, Ltd., Metals Division, Swansea.

Davy, C. H., M.I.Mech.E., Director and Chief Research and Development Engineer, Babcock and Wilcox, Ltd., London; Director, Calorizing Corporation of Great Britain, Ltd.

Herbert, T. M., M.A., M.I.Mech.E., Director of Research, Railway Executive, London.

Hignett, H. W. G., B.Sc., F.R.I.C., F.I.M., Superintendent, Development and Research Department Laboratory, The Mond Nickel Co., Ltd., Birmingham.

Jones, E. H., A.R.I.C., M.I.M.M., F.I.M., Director and General Manager (Bristol), Capper Pass and Son, Ltd., Bristol.

Neave, D. P. C., M.A., M.I.Mech.E., Vice-Chairman, Consolidated Zinc Corporation, Ltd.; Managing Director, Imperial Smelting Corporation, Ltd., London; Director, British Titan Products Co., Ltd.; Broken Hill Corporation, Ltd.; Capper Pass and Son, Ltd.; Fricker's Metal and Chemical Co., Ltd.; Mufulira Copper Mines, Ltd.; National Smelting Co., Ltd.; Wolverhampton Metal Co., Ltd.

Pfeil, L. B., O.B.E., D.Sc., A.R.S.M., F.I.M., Manager, Development and Research Department, The Mond Nickel Co., Ltd., London.

Powell, A. R., F.R.I.C., F.I.M., Research Manager, Johnson, Matthey and Co., Ltd., Wembley.

Quarrell, A. G., D.Sc., Ph.D., A.R.C.S., D.I.C., F.Inst.P., F.I.M., Research Manager, British Non-Ferrous Metals Research Association, London.

Raynor, Professor G. V., D.Sc., D.Phil., M.A., A.I.M., Professor of Metal Physics, University of Birmingham.

Ex-officio : Chairmen of Local Sections

Birmingham

Thomas, Bernard, F.Inst.P., F.Inst.F., A.M.I.Mech.E., A.I.M., Chairman and Managing Director, MacBee, Ltd., Bridgnorth; Proprietor of Grove Foundry Co., Bridgnorth, and Birchills Plating Co., Walsall.

London

Liddiard, E. A. G., M.A., F.I.M., Director, Fulmer Research Institute, Ltd., Stoke Poges, Bucks.

Scottish

Beauchamp, H. R., Regional Manager, Imperial Chemical Industries, Ltd., Metals Division, Glasgow; Director, Scottish Non-Ferrous Tube Industries, Ltd.

NEWS AND ANNOUNCEMENTS

Sheffield

Dale, H. G., F.R.I.C., Chief Chemist, Sheffield Smelting Co., Ltd., Sheffield.

South Wales

Hontoir, E. A., B.Sc., Chief Chemist and Metallurgist, Rio Tinto Co., Ltd., Port Talbot, Glam.

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Ballard, W. E., F.R.I.C., F.I.M.

Rotherham, L., M.Sc., F.I.M.

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United States of America : Professor R. F. Mehl, Ph.D., Hon. Eng.D., Hon. Sc.D. ; Professor C. S. Smith, B.Sc., Sc.D. ; and Dr. R. A. Wilkins.

COMMITTEES FOR 1950-51

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BALL, Major C. J. P. (*Chairman*). SMOUT, Sir Arthur.

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DOREY, Dr. S. F.

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GUETERBOCK, Colonel Sir Paul.

HIGNETT, Mr. H. W. G.

NEAVE, Mr. D. P. C.

Ex-officio

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Senior Vice-President.

Honorary Treasurer.

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NEWS AND ANNOUNCEMENTS

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CHASTON, Dr. J. C.	MADDOCKS, Dr. W. R. (<i>Hon. Secretary, Sheffield Local Section</i>).
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PREECE, Professor A.	
THOMAS, Mr. Bernard (<i>Chairman, Birmingham Local Section</i>).	
BUCKNALL, Mr. E. H. (<i>Hon. Secretary, Birmingham Local Section</i>).	
LIDDIARD, Mr. E. A. G. (<i>Chairman, London Local Section</i>).	
RHODES, Dr. E. C. (<i>Hon. Secretary, London Local Section</i>).	
BEAUCHAMP, Mr. H. R. (<i>Chairman, Scottish Local Section</i>).	

Ex-officio :

President.
Senior Vice-President.
Honorary Treasurer.

MEDAL COMMITTEE.

PRESIDENT (<i>Chairman</i>).	who are, or have been, Members
SENIOR VICE-PRESIDENT.	of Council (to be selected by the
Not more than four medallists	President.)

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COOK, Dr. Maurice.	RAYNOR, Professor G. V.
HANSTOCK, Dr. R. F.	RICHARDS, Dr. T. Ll.
HIGNETT, Mr. H. W. G.	ROTHERHAM, Mr. L.
HUME-ROTHERY, Dr. W.	SMITHELLS, Dr. C. J.
KING, Mr. Ronald.	
MCLEAN, Mr. D.	
NABARRO, Mr. F. R. N.	
OLIVER, Mr. D. A. (<i>representing the Iron and Steel Institute and the British Iron and Steel Research Association</i>).	

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BOWMAN, Mr. W. H.	THOMAS, Mr. W. J.
DAVIES, Mr. C. E.	THORNELLY, Mr. B. N. H.
MILLER, Mr. H. J.	
NEAVE, Mr. D. P. C.	
ROBINSON, Mr. C. G.	
SMITH, Mr. Christopher.	

Ex-officio :

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Chairman, Publication Committee.

NOMINATIONS COMMITTEE.

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NEWS AND ANNOUNCEMENTS

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O'NEILL, Professor H. (*Chairman*).

BAILEY, Mr. G. L.

COOK, Dr. Maurice.

FOX, Dr. F. A.

GADD, Mr. E. R.

HIGNETT, H. W. G. (*representing
Local Sections Committee*).

HUDSON, Mr. F.

JENKINS, Dr. Ivor.

JONES, Mr. E. H.

LIDDIARD, Mr. E. A. G.

MAKOWER, Mr. A.

PHILLIPS, Mr. H. W. L.

POWELL, Mr. A. R.

RAYNOR, Professor G. V.

SLATER, Dr. I. G.

THOMPSON, Professor F. C.

Ex-officio :

President.

Chairman, Finance and General
Purposes Committee.

Honorary Treasurer.

Chairman, Metal Physics Com-
mittee.

Chairman, Metallurgical Engineer-
ing Committee.

ELECTION OF ORDINARY MEMBERS AND STUDENT MEMBERS

The following 22 Ordinary Members and 19 Student Members
were elected on 27 April 1950 :

As Ordinary Members

ANTELO, Héctor Francisco, B.Sc., Chief of the Laboratories,
Fabricá Militar de Aceros, Casilla de Correo No. 2, Sucursal
37, Buenos Aires, Argentina.

ASHEN, Frederick Charles, Fuel Technologist, Imperial Chemical
Industries, Ltd. (Metals Division), Witton, Birmingham 6.

BHADURI, Sukumar, B.Sc., B.Met., Metallurgist, Bhartia Electric
Steel Company, 8 Swinhoe Street, Calcutta 19, India.

CHIAVERINI, Vicente, Engineer, Metallurgical Department,
Instituto de Pesquisas Tecnológicas, São Paulo, Brazil.

CRAIG, George Black, B.A.Sc., Research Student, Department of
Metallurgical Engineering, University of Toronto, Toronto,
Ont., Canada.

DODWORTH, Alfred John, Works Manager, Oakes, Turner and
Company, Ltd., 75-79 Eyre Street, Sheffield 1.

HOUSTON, David Arthur, B.Sc., Technical Officer, H. J. Enthoven
and Sons, Ltd., 89 Upper Thames Street, London, E.C.4.

INGHAM, Bertram Hobart, M.Sc., Ph.D., Technical Librarian,
Hadfields (Merton), Ltd., Western Road, Mitcham, Surrey.

JOLLIVET, Léon, Chef du Service des Recherches, Société Minière et
Métallurgique de Peñarroya, 12 Place Vendôme, Paris, France.

KEHL, George Louis, B.S., M.S., Associate Professor of Metallurgy,
School of Mines, Columbia University, New York 27, N.Y.,
U.S.A.

KILLINGWORTH, Donald, B.Sc., Chief Metallurgist, Ruston and
Hornsby, Ltd., Sheaf Iron Works, Lincoln.

PERETTI, Ettore A., B.S., M.S., D.Sc., Professor of Metallurgy,
University of Notre Dame, Notre Dame, Ind., U.S.A.

RICHARDS, William Gwynfab, B.Sc., Metallurgist, Research
Department, Anglo-Iranian Oil Company, Ltd., Chertsey
Road, Sunbury-on-Thames, Middlesex.

SCHARSCHU, Charles A., B.Chem., Chief Metallurgist and Director
of Research, Allegheny Ludlum Steel Corporation, Bracken-
ridge, Pa., U.S.A.

NEWS AND ANNOUNCEMENTS

- SMURTHWAITE, John William, Deputy Works Manager, Pakistan Government Mint, Lahore, West Punjab, Pakistan.
- DE SOUZA SANTOS, Tharcisio D., Chief Engineer, Metallurgical Department, Instituto de Pesquisas Tecnológicas, São Paulo, Brazil.
- THALL, Burnett M., M.A.Sc., Ph.D., Production Engineer, 80 King Street, Toronto, Ont., Canada.
- THORNELLY, Bernard Norman Heath, B.A., Chief Engineer, Northern Aluminium Company, Ltd., Banbury, Oxfordshire.
- TRELA, Edward, M.S., Metallurgist, Apex Smelting Company, Cleveland, O., U.S.A.
- TUCKER, Herbert John Charles, Southern Area Sales Manager, Electric Furnace Company, Ltd., Weybridge, Surrey.
- WAUCHOPE, Kenneth Laird, Student of Metallurgy, University of Toronto, Toronto, Ont., Canada.

As Student Members

- AUST, Karl Thomas, M.A.Sc., Graduate Student, University of Toronto, Toronto, Ont., Canada.
- BETHUNE, Albert William, B.A.Sc., Graduate Student, Department of Metallurgical Engineering, University of Toronto, Toronto, Canada.
- BUNSHAH, Rointan Framroze, B.Sc., Student of Metallurgy, Carnegie Institute of Technology, Box 202, Pittsburgh 13, Pa., U.S.A.
- CHANG, Wen-Hsiang, B.S., Student of Metallurgy, Missouri School of Mines, Rolla, Mo., U.S.A.
- CLARK, Robert, B.A.Sc., Graduate Student, University of Toronto, Toronto, Ont., Canada.
- CURLOOK, Walter, Student of Metallurgy, University of Toronto, Toronto, Ont., Canada.
- EDWARDS, Frank Fryer, Metallurgist, Enfield Rolling Mills, Ltd., Enfield, Middlesex.
- HULME, Kenneth Gretton, Student of Metallurgy, University College, Swansea.
- LAST, Anthony John, Student of Metallurgy, Battersea Polytechnic, London, S.W.11.
- LEE, Morgan Hamilton, Laboratory Assistant, Richard Thomas and Baldwins, Ltd., Landore, Swansea.
- MARTIN, Alfred John, B.Sc., Research Student, Royal School of Mines, London, S.W.7.
- MOODY, John Wentworth, Student of Metallurgy, University of Toronto, Toronto, Ont., Canada.
- RIDLEY, Norman, Student of Metallurgy, King's College, Newcastle-upon-Tyne 1.
- SCARROTT, Derrick Ronald, Student of Metallurgy, Royal Technical College, Glasgow.
- SYKES, Elwyn C., Metallographer, De Havilland Aircraft Company, Ltd., Hatfield, Herts.
- SYMONDS, John, Student of Metallurgy, University of Birmingham.
- TEGHTSOONIAN, Edward, B.A.Sc., M.A., Graduate Student, University of Toronto, Toronto, Ont., Canada.
- WEINBERG, Fred, B.A.Sc., M.A., Graduate Student, University of Toronto, Toronto, Ont., Canada.
- WINEGARD, William Charles, B.A.Sc., Graduate Student, University of Toronto, Toronto, Ont., Canada.

WRIGHT, John Charles, Laboratory Assistant, Development and Research Department, The Mond Nickel Company, Ltd., Wiggin Street, Birmingham.

PERSONAL NOTES

MR. J. A. AMBLER has left the Rogerstone works of the Northern Aluminium Co., Ltd., and is now in the Company's Development Department at Banbury.

DR. H. P. CROFT has been appointed research engineer to Kennecott Metal Corpn., at their general offices in New York City.

MR. M. E. HARGREAVES, of the Division of Tribophysics of the Commonwealth Scientific and Industrial Research Organization, has been awarded the Ph.D. degree of Cambridge University, where he worked for some time recently.

DR. R. HARGREAVES has recently joined Tiltman Langley Laboratories, Ltd., Redhill, Surrey, as Chief Metallurgist. Since 1945 he had been Technical Manager of the Aero Piston Ring Co., Ltd., Leeds.

MR. N. HASLAM is now a metallurgist with the British Iron and Steel Research Association at Sheffield.

MR. A. W. HOTHERSALL was presented with the Medal of the Electrodepositors' Technical Society at the Society's recent Conference at Eastbourne.

DR. E. OROWAN has been on a visit to the Massachusetts Institute of Technology and expects to return to Cambridge early in July.

MR. EDWARD PLAYER, Managing Director of Birmid Industries, Ltd., has been elected President of the Aluminium Development Association, in succession to Mr. Kenneth Hall.

MR. J. W. POKORNY, is now manager of Diamond Abrasives, Ltd., 55 Greek Street, London, W.1.

DR. A. G. QUARRELL has been appointed Professor of Physical Metallurgy at Sheffield University and will be in charge of a new Post-Graduate School there. This amends the note published in the *Journal* last month.

MR. W. A. REID has been appointed Chief Metallurgist to William Mills, Ltd., Wednesbury, Staffs.

MR. R. P. VARSHNEY is Assistant Professor at the College of Mining and Metallurgy, Benares Hindu University, India.

MR. T. WATSON, Sales Director of General Refractories, Ltd., of Sheffield, was elected President of the Silica and Moulding Sands Association at the Annual General Meeting of members of the Association held in London on 20 April 1950.

MR. A. C. YORKE has been appointed Senior Investigational Chemist in the London Division, British Electricity Authority. He was previously General Manager of the Newbury Plating Co., Ltd., Newbury.

DEATHS

The Editor regrets to announce the deaths of :

DR. HUGO ALEXANDER DICKIE, General Manager, Department of Research and Technical Development, Stewarts and Lloyds, Ltd., Corby, Northants, on 2 May.

MR. FREDERICK HAROLD HURREN, Managing Director of Coventry Malleable and Aluminium, Ltd., Coventry, and an Original Member of the Institute.

NEWS OF LOCAL SECTIONS

COMMITTEES FOR THE SESSION 1950-51

The following Committees have been elected for the session 1950-51 :

Birmingham

Chairman : Bernard Thomas, F.Inst.P., F.Inst.F., A.I.M.
Vice-Chairman and Representative on Co-ordinating Committee of the Midland Metallurgical Societies : H. H. Symonds, F.I.M.
Honorary Secretary : E. H. Bucknall, M.Sc., F.I.M.
Assistant Honorary Secretary : A. W. Matthews, L.I.M.
Honorary Treasurer : R. Chadwick, M.A., F.R.I.C., F.I.M.
Past-Chairmen : E. A. Bolton, M.Sc., F.I.M.; R. Chadwick, M.A., F.R.I.C., F.I.M.; W. L. Govier, F.I.M.
Ordinary Members : H. W. G. Hignett, B.Sc., F.R.I.C., F.I.M.; J. O. Hitchcock, B.Sc., F.I.M.; J. W. Jenkin, B.Sc., Ph.D., F.I.M.; A. J. Rickard, B.Sc., L.I.M.; E. A. Smith (representing Associates); S. S. Smith, M.Met., F.I.M.; and F. E. Stokeld, F.I.M.

London

Chairman : E. A. G. Liddiard, M.A., F.I.M.
Vice-Chairman : C. E. Ransley, Ph.D., M.Sc., F.I.M.
Honorary Secretary : E. C. Rhodes, Ph.D., B.Sc., F.R.I.C. F.I.M.
Honorary Treasurer : J. D. Grogan, B.A.
Past-Chairmen : W. F. Randall, B.Sc., A.R.S.M., M.I.E.E., F.I.M.; J. H. Watson, M.B.E., M.C., B.Sc., Ph.D., A.R.S.M., F.I.M.; G. L. Bailey, M.Sc., F.I.M.
Ordinary Members : R. G. Harper, M.Sc.; E. C. J. Marsh, B.Sc., A.R.I.C.; W. K. B. Marshall, B.Sc., A.I.M.; E. G. V. Newman, B.Sc., A.R.S.M., A.I.M.; and J. R. Knight, B.Sc., L.I.M.

Scottish

Chairman : H. R. Beauchamp.
Vice-Chairman : John Arnott, F.R.I.C., F.I.M.
Honorary Secretary : Matthew Hay.
Honorary Treasurer : N. J. MacLeod.
Ordinary Members : J. E. Chard, B.Sc., A.R.S.M., A.R.I.C., A.I.M.; W. A. Dunlop; John Erskine; E. G. Flack; E. A. Fowler, B.Sc.; John Glover (representing Associates); George MacDonald, O.B.E., B.Sc.; Duncan Turner (representing Associates).

NEWS AND ANNOUNCEMENTS

Past-Chairmen : A. Craig Macdonald, B.Sc., F.R.I.C., M.I.Mech.E., F.I.M.; A. B. Graham; Professor G. Wesley Austin, O.B.E., M.A., M.Sc., F.I.M.

Sheffield

Chairman : H. G. Dale, F.R.I.C.

Vice-Chairman : M. M. Hallett, M.Sc., F.I.M.

Joint Honorary Secretaries : A. J. MacDougall, M.Met., F.I.M., and W. R. Maddocks, Ph.D., B.Sc.

Honorary Treasurer : W. R. Maddocks, Ph.D., B.Sc.

Past-Chairman : Major F. Orme, T.D., M.Met., A.R.I.C., F.I.M.

Ordinary Members : T. B. Bowker; A. Edwards, Ph.D., B.Sc., F.I.M.; H. P. Gadsby, Assoc.Met.; J. F. B. Jackson, B.Sc., A.R.I.C.; Frank Mason, M.I.E.E.; C. Sykes, D.Sc., Ph.D., F.Inst.P., F.R.S.

South Wales

Chairman : E. A. Hontoir, B.Sc., A.I.M.

Honorary Secretary : K. M. Spring, A.I.M.

Honorary Treasurer : W. H. Grenfell.

Past-Chairman : D. W. Hopkins, M.Sc., F.I.M.; Harry Davies, F.I.M.; Roosevelt Griffiths, M.Sc., F.I.M.

Ordinary Members : Professor H. O'Neill, D.Sc., M.Met., F.I.M., J. S. Walton, and L. W. T. Webb (representing Ordinary Members); J. M. Reid, B.Sc., and V. Griffiths, B.Sc. (representing Student Members); C. J. C. Lewis (representing Associate Members).

LONDON LOCAL SECTION

The last meeting of the Section for the 1949-50 session took place on 4 April at 4 Grosvenor Gardens, London, S.W.1. After the annual general business meeting had been held, DR. N. P. ALLEN opened a discussion on

Creep

He began by referring to the characteristic forms of the creep curve and pointing out the difficulties of arriving at an understanding of the nature of the processes taking place during creep by the mathematical analysis of the forms of the curves. These difficulties arose from the fact that several different thermally activated processes were proceeding at the same time, each of which made an unknown contribution to the external deformation of the specimen. He described the processes that had been recognized, illustrating by means of slides slip, grain-boundary movement, relative rotation of grains, recrystallization and grain growth, grain-boundary migration and intercrystalline cracking, all occurring in metals whilst deforming slowly at high temperatures, and discussed some attempts that had been made to study the processes separately. The methods that were available in practice for increasing the creep-resistance of metals and alloys were considered, and attention was drawn to the importance of grain-size, stability of work-hardening at the temperature of service, precipitation-hardening reactions of a suitable type, and the absence of traces of impurities that weaken the grain boundary.

LETTER TO THE EDITOR

THE EQUILIBRIUM DIAGRAM OF THE SYSTEM CHROMIUM-MANGANESE: A CORRECTION

SIR,

In the paper by Carlile, Christian, and Hume-Rothery (*J. Inst. Metals*, 1949-50, 76, 169) on the equilibrium diagram of the system chromium-manganese, the solubility limit of the chromium-rich (α) solid solution was determined above 1000° C., and the resulting $\alpha/(\alpha + \theta)$ boundary was shown in Figs. 5 and 6. In Fig. 7, owing to an accident in drawing, the boundary was shown continuing as a vertical line from 1000° to 500° C. Actually the boundary was not determined in this range, and the vertical line is incorrect because, as stated in the paper, the alloys undergo changes at low temperatures. In Fig. 7, therefore, the $\alpha/(\alpha + \theta)$ boundary should not be drawn below 1000° C. We very much regret the confusion which may have been caused, and hope that Fig. 7 will not be reproduced without correction.

Yours, &c.

W. HUME-ROTHERY.

J. W. CHRISTIAN.

Oxford
April 1950.

JOINT ACTIVITIES

BEILBY MEMORIAL AWARDS, 1949

The Administrators of the Sir George Beilby Memorial Fund, representing the Institute of Metals, the Royal Institute of Chemistry, and the Society of Chemical Industry, have decided to make three awards, each of one hundred guineas, from the Fund for 1949. These awards have been made to:

F. R. N. NABARRO, M.B.E., M.A., B.Sc. (Oxon.), in recognition of his application of mathematical methods to the elucidation of the mechanical properties of metals.

CHARLES ERIC RANSLEY, M.Sc., Ph.D. (Lond.), F.I.M., in recognition of his experimental contributions to knowledge of the behaviour of gases in metals.

KEBLE WATSON SYKES, M.A., B.Sc., D.Phil. (Oxon.), in recognition of his experimental contributions to the study of the combustion of carbon and its oxidation by steam.

Awards from the Fund are made to British investigators in science as a mark of appreciation of distinguished work, particularly in such fields as fuel economy, chemical engineering, and metallurgy in which Sir George Beilby's special interests lay. In general, the awards are not applicable to the more senior investigators but are granted as an encouragement to relatively young men who have done independent work of exceptional merit over a period of years.

Mr. Nabarro and Dr. Ransley are both members of the Institute of Metals.

Mr. Nabarro was born in London in 1916, and educated at Nottingham High School and New College, Oxford, where he obtained Firsts in Physics and Mathematics, with distinction in Thermodynamics. In 1938, as a Senior Scholar of New College, Oxford, he went to the University of Bristol to work under Professor N. F. Mott, and before the war he published work on the effect of internal strains on precipitation in alloys, and on a simple theory of precipitation-hardening. During the war, he was employed by the War Office and the Army Operational Research Group of the Ministry of Supply on problems ranging from the design of radar aerial systems to a study of the effects of bombing and shelling on an army unit in the field. He was awarded the M.B.E. in 1946.

Mr. Nabarro returned to Bristol as a Royal Society Warren Research Fellow in 1945, and since then has worked principally on the dislocation theory of slip. Since 1947 he has been a Lecturer in Metallurgy in the University of Birmingham and is now also a Research Fellow in Metallurgy of that University.

Dr. Ransley was born in London and educated at Wembley County School. He joined the Research Laboratories of The General Electric Co., Ltd., as a student-assistant, and graduated in chemistry at the University of London as an external student in 1932.

As a member of the metallurgical staff of these Laboratories he was engaged mainly on problems connected with tungsten, molybdenum, nickel, and other materials used in the manufacture of lamps and thermionic valves. Early investigations included an examination of the properties of very fine filament wires, orientation effects in molybdenum sheet, and the development of nickel alloys for high-emission thermionic cathodes. He became interested in gas-metal reactions and was co-author with Dr. C. J. Smithells of a series of papers published in 1935-36 dealing with various aspects of the diffusion of gases through metals. He also made a study of the copper-oxygen system and developed methods for the micro-analysis of gases at low pressures.

From 1940 to 1945 Dr. Ransley devoted most of his attention to the development and production of silicon mixer and rectifier crystal valves for radar applications. At the latter end of this period, however, an investigation was made, with Mr. R. Eborall of the British Non-Ferrous Metals Research Association, of the effects of hydrogen and steam on the welding behaviour of the high-strength aluminium-magnesium alloys.

In 1945 he took up his present position at the Research Laboratories of The British Aluminium Company at Gerrards Cross, Bucks., where he is in charge of a group working mainly on various problems arising in the casting and fabrication of aluminium and its alloys. This work has included a study of gas equilibria in solid and liquid metals, a part of which has already been published.

Dr. Ransley serves on a number of advisory committees concerned with various aspects of metallurgical research. Much of his work has been published in the *Proceedings* of the Royal Society and the *Journal* of the Institute of Metals.

OTHER NEWS

THE INSTITUTION OF METALLURGISTS: NEW ELECTIONS

The following elections have recently been announced:

As Fellows

R. W. Bailey (Zinc Development Association), F. Buckley (English Electric Co., Ltd.), N. Lindley (Ministry of Supply, A.I.D.), J. McNeil (The Mond Nickel Co., Ltd.), T. Parry (Raleigh Industries, Ltd.), E. Simister (Kirkstall Forge, Ltd.), A. H. Sully (Fulmer Research Institute, Ltd.).

As Fellows from the Grade of Associate

A. G. Anderson (Union Steel Corporation (of South Africa), Ltd.), C. Macquarie (Stewarts and Lloyds, Ltd.), W. A. Smith (Stewarts and Lloyds, Ltd.).

As Associates

J. H. Allan (Effingham Steel Works, Ltd.), D. R. Allen (W. J. Fraser and Co., Ltd.), D. R. Baker (Steel, Peech and Tozer), E. H. Baldwin (Colvilles, Ltd.), J. Bateman (Hard Metal Tools, Ltd.), P. W. Bygate (Brown Bayley's Steel Works, Ltd.), F. J. Chantry (Oakes, Turner and Co., Ltd.), B. L. Daniell (Battersea Polytechnic), F. Friedlaender (Binani Metal Works, Ltd., Calcutta), S. J. Garvin (Mond Nickel Fellow (M.I.T.)), L. Grainger (Admiralty), D. Hadfield (Swift Levick and Sons, Ltd.), G. B. Heslop, L. D. Hewitt (Stewarts and Lloyds, Ltd.), J. Y. Higgs (Tin Research Institute), J. S. Morton (Telegraph Construction and Maintenance Co., Ltd.), P. M. Munro (Firth-Vickers Stainless Steels, Ltd.), B. R. Nagar (Ministry of Industry and Supply, Burnpur, India), S. Tahir (Egyptian Government), E. H. Watson (English Steel Corporation, Ltd.), R. Whittaker (Samuel Fox and Co., Ltd.), C. B. Wright (Davy and United Roll Foundry, Ltd.), D. E. Yeomans (Imperial Chemical Industries, Ltd.).

As Associates from the Grade of Licentiate

L. H. Baxter (Ruston and Hornsby, Ltd.), W. F. Biddle (Ministry of Supply, A.E.R.E.), W. R. Burrow (Broken Hill Associated Smelters Pty., Ltd., Australia), E. V. Dewhirst (Hopkinsons, Ltd.), P. J. E. Forsyth (Royal Aircraft Establishment), W. G. Heaton (Imperial Chemical Industries, Ltd., Metals Division), E. Jackson (Sheffield Smelting Co., Ltd.), M. Roberts (Vowles Bros., Ltd.), R. K. Tait (Union Steel Corporation (of South Africa), Ltd.), M. B. Waldron (Ministry of Supply, A.E.R.E.).

As Licentiates

T. Bayley (The British Aluminium Co., Ltd.), D. A. Black (Clyde Alloy Steel Co., Ltd.), D. Cemm (Ministry of Supply, A.I.D.), S. K. Dhar (Ordnance Factory, Ambarnath), C. C. Hanson (Ever Ready Co. (Great Britain), Ltd.), F. A. Kirk (Thos. Firth and John Brown, Ltd.), G. E. Leybourne (Thos. Firth and

NEWS AND ANNOUNCEMENTS

John Brown, Ltd.), J. Little (Colvilles, Ltd.), R. S. M. Moffatt (Appleby-Frodingham Steel Co., Ltd.), J. B. Morgan (Steel Company of Wales, Ltd.), J. B. Moss (The Staveley Iron and Chemical Co., Ltd.), P. R. Purcell (Stewarts and Lloyds, Ltd.), M. Rai (Metal and Steel Factory, Ishapore), K. E. Revell (Standard Motor Co., Ltd.), A. J. Rickard (High Duty Alloys, Ltd.), N. K. Sengupta (B.N. Railway, India), G. W. Stewart (West Yorkshire Foundries, Ltd.), C. Storey (United Steel Companies, Ltd.), D. G. Thomas (British Iron and Steel Research Association), V. Thomas (University College, Cardiff), W. T. Tyler (Imperial Chemical Industries, Ltd., Metals Division), J. I. de Villiers (Union Steel Corporation (of South Africa), Ltd.), D. H. Wilkinson (Royal Ordnance Factory, Birtley), J. R. Williams (Needle Industry, Ltd.).

METALS IN THE SERVICE OF MANKIND

Under the title of "Metals in the Service of Mankind" the Institution of Metallurgists has organized an Exhibition which will be opened by H.R.H. Princess Margaret on 6 July 1950, at the Science Museum, South Kensington. From 7 July to the end of September the Exhibition will be open to the public.

The Exhibition consists of 21 separate stands in which all the important industrial metals, the rarer metals, and the precious metals, are represented. Some attention is also given to such subjects as welding, metal finishing, metal testing, and electro-deposition.

In connection with the Exhibition a handbook is being prepared which will contain a short guide to the exhibits and a full section on the Story of the Metals in language suitable for the general reader. This book will be available at the Exhibition and from the Institution of Metallurgists, 4 Grosvenor Gardens, London, S.W.1, price 1s.

NEW GROUP FOR STUDY OF CONSTITUTION OF ALLOYS

For some time it has appeared desirable that some organization should undertake the co-ordination of phase-diagram work being carried out in connection with metallurgical subjects, especially the transitional elements and high temperature alloys. The Metal Physics Committee of the British Iron and Steel Research Association, which is charged to take an active interest in the co-ordination of the progress of metal physics in Great Britain, has now appointed a Constitution of Alloys Group to consider this specific aspect of its work.

The Chairman of the Group is PROFESSOR G. V. RAYNOR (Birmingham University), and its members are:

MR. R. L. BICKERDIKE, Royal Aircraft Establishment.

DR. A. J. BRADLEY, B.S.A. Group Research Centre.

DR. A. M. B. DOUGLAS, Cavendish Laboratory, Cambridge.

DR. G. A. GEACH, Associated Electrical Industries, Ltd.,
Research Laboratory.

MR. H. J. GOLDSCHMIDT, B.S.A. Group Research Centre.

DR. J. L. HAUGHTON, Essex Aero, Ltd.

DR. W. HUME-ROTHERY, Oxford University.

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MR. H. W. L. PHILLIPS, British Aluminium Co., Ltd.
DR. A. G. QUARRELL, British Non-Ferrous Metals Research Association.
DR. T. RAINE, Metropolitan-Vickers Electrical Co., Ltd.
MR. W. P. REES, National Physical Laboratory.
DR. A. H. SULLY, Fulmer Research Institute.
DR. H. SUTTON, Ministry of Supply.

The Terms of Reference are to be: "To co-ordinate constitutional studies of interest to metallurgists, to encourage further work which the Group consider necessary and to recommend to the Metal Physics Committee (of B.I.S.R.A.) the provision of support in suitable cases".

It is obvious that it is impossible to include in the membership of the Group a representative from each centre engaged in work of interest to the Group, but from time to time non-members will be invited to contribute to discussions on particular topics. Already many centres have given the Group details of work carried out and proposed in their laboratories.

The Group will try to keep in touch with all centres concerned with the constitutional studies included in its terms of reference. It will welcome enquiries and information from research workers and laboratories not represented by the membership of the Group, and in particular, it will be glad to receive suggestions of aspects of constitutional studies which ought to receive attention.

A.S.M. METALLOGRAPHIC EXHIBIT

The American Society for Metals is again organizing a Metallographic Exhibit—the fifth of the series—in connection with the National Metal Congress and Exposition to be held in Chicago, 23–27 October 1950. Hundreds of entries were received last year and a number of awards were made to Europeans. A special effort is being made to give the Exhibit an international character this year, and entries from overseas will be particularly welcomed. Details are given below.

Rules for Entrants

Work which has appeared in previous Metallographic Exhibits held by the American Society for Metals is unacceptable.

Photographic prints shall be mounted on stiff cardboard, each on a separate mount. Each shall carry a label giving:

- Name of metallographer.
- Classification of entry.
- Material, etchant, magnification.
- Any special information as desired.

Transparencies or other items to be viewed by transmitted light must be mounted on light-tight boxes wired for plugging into an ordinary lighting circuit, and built so they can be fixed to the wall.

Exhibits must be delivered between 1 and 20 October 1950, either by prepaid express, registered parcel post, or first-class letter mail.

Address: Metallographic Exhibit, c/o W. H. Eisenman, National Metal Congress and Exposition, International Amphitheater, Chicago, Ill., U.S.A.

NEWS AND ANNOUNCEMENTS

Classification of Micros

1. Cast Irons and Cast Steels.
2. Tool Steels (except Carbides).
3. Irons and Alloy Steels (excluding Stainless) in Wrought Condition.
4. Stainless and Heat-Resisting Steels and Alloys.
5. Light Metals and Alloys.
6. Heavy Non-Ferrous Metals and Alloys.
7. Powder Metals (and Carbides) and Compacts.
8. Weld Structures (including brazed and similar joints).
9. Series of Micros Showing Transitions or Changes During Processing.
10. Surface Phenomena and Macrographs of Metallurgical Objects or Operations (2 to 10 dia.).
11. Results by Non-Optical or other Unconventional Techniques.

Awards and Other Information

A committee of judges will be appointed by the Metal Congress management which will award a first prize (a medal and blue ribbon) to the best in each classification. Honourable Mentions will also be awarded to other photographs which, in the opinion of the judges, closely approach the winner in excellence.

A Grand Prize, in the form of an engrossed certificate, and a money award of \$100 will be awarded the exhibitor whose work is adjudged "best in the show", and his exhibit shall become the property of the American Society for Metals for preservation and display in the Sauveur Room at the Society's Headquarters.

All other exhibits will be returned to owners by prepaid express or registered parcel post during the week of 29 October 1950.

Entrants living outside the U.S.A. will do well to send their micrographs by first-class letter mail endorsed "May be opened for customs inspection before delivery to addressee".

CAMBRIDGE SUMMER SCHOOL IN ELECTRON MICROSCOPY, 1950

By the courtesy of Professor Sir Lawrence Bragg, O.B.E., F.R.S., a Summer School in Electron Microscopy will be held again this year in the Cavendish Laboratory.

The School will provide a grounding in the theory and applications of the electron microscope. It is intended for those who are already, or in the near future will be, operating it in physical, chemical, or biological laboratories. The lectures will deal with the fundamental theory and operating principles of the electron microscope. The various techniques of specimen preparation will be demonstrated, and practised in small groups by the class. The three leading models of instrument will be used, and discussions held on their special characteristics.

The School will be held from 18 to 29 July inclusive. A detailed syllabus and form of application for admission may be obtained from G. F. Hickson, M.A., Secretary of the Board of Extra-Mural Studies, Stuart House, Cambridge, to whom the completed application form should be returned not later than 5 June 1950.

BINDING CASES FOR 1945, 1946, 1947, & 1948 AND MONTHLY PARTS OF BACK ISSUES OF THE JOURNAL: FREE ISSUE

Free copies of the cloth binding cases for the *Journal* and *Metallurgical Abstracts* for 1945 to 1948 inclusive are still available for members and subscribers to these publications who have not received them.

Members and subscribers to the *Journal* will also be supplied free with any past issues of the monthly series that are missing from their files during the period of their regular subscription (as far as they are available). The Institute is forced to dispose of surplus copies of these issues in order to provide space for later publications. Early application should be made, please.

APPOINTMENTS VACANT

ALUMINIUM LABORATORIES, LTD., Banbury, Oxon, have vacancies in their research division for metallurgists, preferably experienced in the casting of aluminium alloys. They have also a vacancy in their corrosion testing laboratory for which either a metallurgist or electro-chemist experienced in corrosion testing would be considered. Salary in accordance with training and experience. Applications in writing should be made to the Director of Research.

A WELL-KNOWN COMPANY has the following appointments vacant in London:

ELECTRO-CHEMIST, with research and practical experience in the electrodeposition of metals, to take charge of development work in the plating field. Salary according to qualifications, but not less than £800 p.a.

EXPERIENCED RESEARCH WORKER, with good academic qualifications, for non-ferrous metallurgical investigations. Salary according to qualifications, but not less than £800 p.a.

CHEMIST, with good academic qualifications and several years' industrial chemical experience, preferably including catalysts, ceramics, or paints, required for development work in connection with applications of chemical products in industry in the U.K. and abroad. Salary according to qualifications, but not less than £700 p.a.

YOUNG GRADUATE, preferably with some research experience, for non-ferrous metallurgical investigations. Salary not less than £400 p.a.

Applications, giving full particulars, to: Box No. 720, T & G, 101 St. Martin's Lane London, W.C.2.

BRITISH NON-FERROUS METALS RESEARCH ASSOCIATION. Information Department. Assistant required. Scientific training (not necessarily in metallurgy). Knowledge of languages an advantage. Salary up to £500 p.a., depending on qualifications and experience. Apply by letter only to the Secretary, B.N.F.M.R.A., Euston Street, London, N.W.1.

UNIVERSITY COLLEGE OF SWANSEA. Applications are invited for Research Studentships in (a) Engineering and (b) Metallurgy which are tenable for one year from 2 October 1950, and may be renewed for a second year. Applicants should have qualifications in Mathematics, Physics, Chemistry, Engineering, or Metallurgy. The value of the Studentships will be within the range £450-£600 per annum; but the limits of that range may be varied on exceptional grounds. Further particulars may be obtained from the Registrar, University College, Singleton Park, Swansea, by whom applications must be received on or before Wednesday, 21 June 1950.

THE SOLIDIFICATION OF CASTINGS

. . . by R. W. Ruddle

This survey of the literature on the solidification of castings and methods of controlling solidification covers both ferrous and non-ferrous metals and alloys. It is divided into two main sections. The first deals, in a general way, with the work that has been done towards the empirical application of scientific principles to the production of castings and ingots; in this section the concept of "directional solidification" is discussed and the various means available to attain this end are considered. The second part of the book is concerned with the more fundamental study of the solidification rates of castings and ingots. In an Appendix, a critical survey is given of the available data on the thermal properties of metals and mould materials.

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NON-FERROUS METAL MELTING AND CASTING OF INGOTS FOR WORKING

This symposium on metallurgical aspects of the subject consists of the following six papers by recognised authorities and a full report of an important discussion held at a meeting attended by nearly 400 metallurgists. The papers are "Melting and Casting of Non-Ferrous Metals", by G. L. Bailey and W. A. Baker; "The Production of Refined-Copper Shapes", by R. H. Waddington; "Melting and Casting Aluminium Bronze Ingots for Subsequent Working", by A. J. Murphy and G. T. Callis; "The Application of Flux Degassing to Commercially Cast Phosphor-Bronze", by N. I. Bond-Williams; "The Melting and Casting of Brass", by Maurice Cook and N. F. Fletcher; "The Melting and Casting of Nickel Silver at the Works of Henry Wiggin and Co., Ltd.", by E. J. Bradbury and P. G. Turner.

A book for the practical metallurgist

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Metallurgical Applications of the **ELECTRON MICROSCOPE**

This book contains 13 papers presented at a Symposium on the subject, together with report of a general discussion that took place upon them. Some of the papers summarise the present state of knowledge and experience in Great Britain, France, Germany and the United States, but others record the results of hitherto unpublished researches. The discussion contains important contributions from metallurgists and from leading authorities in the field of electron microscopy.

Besides being of value to all physicists and metallurgists working in this field, the book gives a most useful introduction to the subject for those who wish to know the potentialities and limitations of this comparatively new technique.

A comprehensive guide to the use of the electron microscope in metallurgy.

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INSTITUTE NEWS AND ANNOUNCEMENTS

AUTUMN MEETING, BOURNEMOUTH, 18-22 SEPTEMBER 1950

A full programme of this meeting, with reply form, will be distributed to members, but—pending its receipt—members are urged to book their hotel accommodation without delay. A list of some conveniently-situated hotels was given on pp. 141-142 of the news section of the May 1950 issue of the *Journal*.

The paper listed in the provisional programme as "to be invited or selected" for presentation at 10.0 a.m. on Thursday, 21 September, will be by Mr. J. J. Hoben and Mr. J. F. Mulvey (Works Manager and Assistant Works Manager, respectively, of the Scovill Manufacturing Co.) on the new continuous brass mill of the Scovill Manufacturing Co., at Waterbury, Conn., U.S.A. This paper, which deals in detail with the process from continuous casting to finished cold-rolled strip, should be of wide interest and stimulate a valuable discussion. It is hoped to print the paper in the July 1950 issue of the *Journal*.

METALLURGICAL APPLICATIONS OF THE ELECTRON MICROSCOPE

The 13 papers, and a report of the discussion, of the Institute's symposium on "Metallurgical Applications of the Electron Microscope" have now been issued as No. 8 of the Monograph and Report Series. The book, which is attractively bound in cloth, contains 170 pages, 50 plates, and numerous illustrations in the text. The published price is 21s. or \$3.50, post free; every member of the Institute may purchase one copy at the special price of 10s. 6d. or \$2.00, post free.

The book as a whole forms a comprehensive and up-to-date guide to the use of the electron microscope in metallurgy and, besides being valuable to all physicists and metallurgists already working in the field, will serve as a most useful introduction to the subject for those metallurgists who may not yet fully appreciate the potentialities and limitations of this comparatively new technique.

SYMPOSIUM ON COLD WORKING

The Panel of the Publication Committee responsible, has now issued invitations to authors of papers for the Symposium on "Metallurgical Aspects of the Cold Working of Non-Ferrous



Aerial View of Bournemouth.

NEWS AND ANNOUNCEMENTS

Metals and Alloys", which is to be held in connection with the Annual General Meeting in March 1951. A most interesting series of papers has been arranged, and these will be published in the January 1951 issue of the *Journal*.

METAL PHYSICS: INFORMAL MEETINGS

To meet what appears to be a real need on the part of those concerned with metal physics, the Council has undertaken to provide the Metal Physics Committee with facilities for the holding of informal meetings in connection with General Meetings of the Institute or otherwise.

The Metal Physics Committee hopes to take advantage of these facilities either during the winter months or at the Annual General Meeting in March 1951. It will not, however, arrange such a meeting in connection with the next Autumn Meeting at Bourne-mouth, as had been announced in the provisional programme.

SIMULTANEOUS SESSIONS AT GENERAL MEETINGS

The Council has agreed in principle that, with effect from the Annual General Meeting 1951, simultaneous sessions may be held at the meetings of the Institute, provided the subjects under discussion are of a sufficiently diverse character. It is hoped that by this means a greater number of papers will be discussed and the meetings will attract more members.

ELECTION OF ORDINARY MEMBERS AND STUDENT MEMBERS

The following 19 Ordinary Members and 7 Student Members were elected on 29 May 1950:

As Ordinary Members

- BERTRANDIAS, Jean Antoine George, Ing., Engineer, Research Department, Ets. Bertrandias, 33 rue de Plaisance, La Garenne-Colombes (Seine), France.
- BHATNAGAR, Parmatma Sarup, B.Sc., M.Sc., Assistant Professor, Engineering College, Benares Hindu University, India.
- BOUCHAUD, Peter, Staff Engineer, Société Lorraine de Laminage Continu (SOLLAC), Hayange (Moselle), France.
- BRADSHAW, Francis Julian, M.A., Physicist, British Iron and Steel Research Association, 11 Park Lane, London, W.1.
- CESANA, Giorgio, Chairman and Manager, A. Cesana, 50 via S. Marco, Milano, Italy.
- CHAMBERLAIN, Alan, B.Eng., Research Metallurgist, Gearing Research and Development Department, Vickers Armstrong, Ltd., Naval Construction Works, Barrow-in-Furness, Lancashire.
- DAS GUPTA, Dhruva Ranjan, B.Sc., Chemist, Sand Testing Laboratories, B.E.S. Co., Ltd., Calcutta, India.
- DICK, Alexander Walter Henry, B.Sc., Chief Chemist, The Delta Metal Company, Ltd., Delta Works, East Greenwich, London, S.E.10.
- DIXON, Wilfred, Technical Publications Officer, Ministry of Supply, Leatherhead Road, Chessington, Surrey.
- EDMONDS, Vincent Louvaine, Estimator, Imperial Smelting Corporation, Ltd., Swansea Vale Works, Llansamlet, Morriston, South Wales.



The Square, Bournemouth.



The Bay, looking West.

NEWS AND ANNOUNCEMENTS

- FAILONI, Vittorio, Dr.Ing., Consulting Engineer, Corso Italia No. 6, Milano, Italy.
- GIROUDOT, Pierre, Laboratory Chief, Société pour le Forgeage et l'Estampage des Alliages Légers (FORGEAL), Usine du Piat, Issoire (Puy-de-Dôme), France.
- JOHANSEN, Frederick Charles, D.Sc., Director of Research, Avery Research Administration, Ltd., Soho Foundry, Birmingham 40.
- LEHANE, Thomas John, Assistant Works Manager, United Kingdom Chemicals, Ltd., Port Tennant Works, Swansea.
- LIVINGSTON, John A., President, Cerium Metals Corporation, 153 Waverly Place, New York 14, N.Y., U.S.A.
- OLD, Bruce Scott, B.S., Sc.D., Director, Arthur D. Little, Inc., 30 Memorial Drive, Cambridge 42, Mass., U.S.A.
- PEARSON, Thomas Gibson, B.Sc., Ph.D., D.Sc., Assistant Director of Research, The British Aluminium Co., Ltd., Chalfont Park, Gerrards Cross, Buckinghamshire.
- PHAILBUS, Theodore, B.Sc., Assistant Engineer, Punjab Government, Public Works Department, Irrigation Branch, Lahore, Pakistan.
- TIMM, Harold A., B.Sc., Metallurgical Engineer, Dominion Magnesium, Ltd., Haley, Ont., Canada.

As Student Members

- CLARK, John Beverley, B.A.Sc., Graduate Student, Carnegie Institute of Technology, Schenley Park, Pittsburgh 13, Pa., U.S.A.
- DANIEL, Alan Raymond, Student of Metallurgy, Battersea Polytechnic, London, S.W.11.
- DUTT, Asoke Kumer, B.A., Vacation Student, Bhartia Electric Steel Co., Ltd., 8 Swinhoe Street, Calcutta 19, India.
- KENAGHAN, Francis John, B.Sc., Apprentice Metallurgist, Birmingham Small Arms Tools, Ltd., Marston Green, Birmingham.
- MURAD, Abu Bakr, B.Sc., Student of Metallurgy, Royal Technical College, Glasgow.
- PENMAN, Robert Roland, B.S., Graduate Student, Missouri School of Mines and Metallurgy, Rolla, Mo., U.S.A.
- REITER, Stanley F., B.M.E., M.E., Graduate Student, Hammond Metallurgical Laboratory, Yale University, New Haven, Conn., U.S.A.

DISCUSSION OF PAPERS

In order to assist the Committee responsible for arranging the programmes of the General Meetings of the Institute, will all members who are prepared to discuss orally any of the papers published in the *Journal* please inform the Secretary as soon as possible.

It is hoped that such information will enable programmes to be arranged which will secure well-attended and lively discussions.

PERSONALITIES

MR. E. E. SCHUMACHER : AUTUMN LECTURER 1950

Mr. Earle E. Schumacher was born in Chelsea, Mich., on 10 May 1896, and was educated at the University of Michigan. Serving for two years as Research Assistant to the Head of the Department of Physical Chemistry, he laid the foundation for his subsequent interest in physico-metal problems. With the increasing involvement of the United States in World War I he interrupted his advanced training to enter the Western Electric Company, the manufacturing unit of the Bell Telephone System, at its research laboratories in New York. There he became closely identified

with early electronic valve development, making important contributions in the fields, first, of thermionically active filament coatings and, subsequently, of filament alloys.

With the transformation of the Western Electric Company Laboratories into the Bell Telephone Laboratories to serve the whole Bell System in 1925, Mr. Schumacher was instrumental in the organization and expansion of the metallurgical department for the more fundamental, and at the same time wider, study of the growing metallurgical problems peculiar to the communications industry. For years past, as Chief Metallurgist, he has directed the activities of the group of scientists of this division.

It not only carries out development work leading to the eventual large-scale manufacture of cable-sheath, conductor, contact, magnetic, and other alloys, but also conducts fundamental studies in physical metallurgy and metal physics. The department is ultimately responsible for the range of metallic materials used by the Bell System, and its efforts are reflected through the country-wide network of operating companies.

During World War II, with the energies of the Bell Laboratories diverted to war activities, Mr. Schumacher guided studies of considerable importance to the war effort of his country.

Mr. Schumacher and his colleagues of the group have given numerous papers before the technical societies and have been active in their affairs. He has served on many committees of the American Institute of Mining and Metallurgical Engineers, becoming Chairman of its Institute of Metals Division in 1945. At present he is a Director of the society. In February 1950 he delivered the annual Institute of Metals Division Lecture before



the society. He is also a member of the American Society for Testing Materials and of the American Foundrymen's Society. During 1949 he served as a member of the seven-man panel on metallurgy of the U.S. Government's Research and Development Board. Mr. Schumacher was elected a member of the Institute of Metals in 1943.

MR. M. HAMBURGER

Mr. Max Hamburger, who was recently elected Honorary Corresponding Member to the Council for the Netherlands, is the son of the late Mr. J. Hamburger, J.Azn., who for many years, until his death in 1946, also served the Institute of Metals as Honorary Corresponding Member.

He was born on 8 January 1912, and, after being educated in the Netherlands, studied metallurgy at the University of Birmingham, where he specialized in lead and zinc.

In 1935 Mr. Hamburger entered the Royal Dutch Zinc and Lead Rolling Mills, and, after some years spent working in all departments of the company, technical as well as commercial, he was appointed Assistant Technical Manager. In 1940



he and the greater part of the management were dismissed by the German invaders, but after the liberation of the Netherlands he and the other legitimate Directors returned to the badly damaged works in May 1945. Mr. Hamburger was then made General Works Manager and, on the death of his father, one of the Managing Directors of the firm. In this post his first task was the technical reconstruction of the mills, which for the greater part was completed in 1946 and 1947.

Mr. Hamburger was elected a Student Member of the Institute of Metals in 1932 and became an Ordinary Member in 1935.

MR. E. A. HONTOIR, B.Sc., A.I.M.

Mr. Edward Albert Hontoir, who was recently elected Chairman of the South Wales Local Section, was born at Church Crookham, Hants, in 1907, and was educated at Battersea Grammar School, London.

He has held the appointments of bio-chemist at the Virological Pathological Research Laboratories (1923-26); metallurgical chemist to the Eyre Smelting Co., Ltd., Merton Abbey (1926-27); chief metallurgical chemist to E. Austin and Sons, Ltd., Hackney Wick (1927-29); and has been with the Rio Tinto Co., Ltd., since 1929, first as metallurgical chemist at the assay office in London until



1939, subsequently as assistant manager and refiner at the copper refinery at Port Talbot until 1945, and from that date until the present has been chief chemist and metallurgist at the assay office, which is now situated at Port Talbot.

Mr. Hontoir graduated in metallurgy at the Sir John Cass Technical Institute, London, in 1939, became a member of the Institute of Metals in 1946, and was elected an Associate of the Institution of Metallurgists in the same year. He has served on the Committee of the South Wales Local Section of the Institute since 1946.

He has recently been elected Vice-President of the Port Talbot Chamber of Commerce and Shipping.

MR. BERNARD THOMAS, F.Inst.P., F.Inst.F., A.I.M., A.I.Mech.E.

Mr. Bernard Thomas, the new Chairman of the Birmingham Local Section, was born in 1903 and educated at Wolverhampton Municipal Grammar School. He received his metallurgical training at the County Technical College, Wednesbury, followed by 10 years of intensive part-time research work, which resulted in the awards of medals and prizes by the Staffordshire Iron and Steel Institute and the Birmingham Metallurgical Society.

Mr. Thomas joined the staff of Edward Elwell, Ltd., Wednesbury, in 1920 as laboratory assistant and ultimately became Technical Manager. He was appointed Chief Metallurgist of Chillington Tool Co., Ltd., Wolverhampton, in 1934 and became Technical Director in 1941. At the same time he was made Managing Director of Midland Heat Treatments, Ltd., Wolverhampton and in 1942 Technical Director of Edge Tool



NEWS AND ANNOUNCEMENTS

Industries, Ltd., all three positions being held at the same time. At the end of the war he formed the Birchills Plating Co., Walsall, and later the Grove Foundry Co., Bridgnorth; early in 1948 he was appointed Chairman and Managing Director of MacBee, Ltd., Bridgnorth.

In addition to these activities, Mr. Thomas was visiting lecturer in metallurgy at the County Technical College, Wednesbury, for 20 years and at the Wolverhampton and Staffordshire Technical College for 8 years concurrently. He is the author of numerous scientific papers and articles published in this country and America.

Mr. Thomas is a Past-President of the Staffordshire Iron and Steel Institute; he was elected a Fellow of the Institute of Physics in 1938, a Fellow of the Institute of Fuel in 1939, an Associate of the Institution of Mechanical Engineers in 1940, and an Associate of the Institution of Metallurgists on its formation. He was elected a member of the Institute of Metals in 1938.

PERSONAL NOTES

MR. J. ARNOTT (Member of Council) has been awarded the Oliver Stubbs Gold Medal for 1950. The award was made by the Institute of British Foundrymen in recognition of his outstanding services to that Institute in presenting several papers of a particularly high standard and by his active participation in the work of the Technical Council and Technical Committees.

MR. WALTER BONSACK has been appointed Vice-President and Director of Research of the Christiansen Corpn., Chicago 51, Ill.

MR. E. W. COLBECK, metallurgical and research director of Hadfields, Ltd., has been elected President of the Institution of Metallurgists in succession to Dr. Maurice Cook.

DR. MAURICE COOK has received the Honorary Associateship of the Birmingham Central Technical College.

M. Y. DARDEL has left the Centre de Documentation Sidérurgique, Paris, and joined the Climax Molybdenum Co., Zürich.

MR. COLIN GRESTY has been elected Senior Vice-President of the Institute of British Foundrymen for the year 1950-51.

DR. M. HANSEN has been appointed Supervisor of Non-Ferrous Metals Research at the Armour Research Foundation of the Illinois Institute of Technology, Chicago, Ill. He was previously Senior Metallurgist.

MR. R. F. HUDSON has left the employment of the Commonwealth Aircraft Corporation to take up an appointment as metallurgist with the Melbourne and Metropolitan Tramways Board at its laboratories at Preston, Victoria, Australia.

MR. A. E. JENKINS has been awarded the degree of M.Eng.Sc. of the University of Melbourne. He has been appointed Research Officer of the Commonwealth Scientific and Industrial Research Organization and will continue to work in the Baillieu Laboratory of the University on the structure and properties of titanium alloys.

SIR ANDREW McCANCE delivered the Edward Williams Lecture to the Institute of British Foundrymen at its Annual Conference, at Buxton, on 7 June. His subject was "Gases and Steel".

MR. P. E. MADSEN is now at the Atomic Energy Research Establishment, Harwell, Berks.

MR. A. R. MARTIN has received the British Foundry Medal and Award, which is presented annually by the Institute of British Foundrymen to the author of the paper adjudged to be the best presented to the Institute in the preceding year. Mr. Martin's paper was entitled "Some Notable Aluminium Alloy Castings".

DR. C. H. MATHEWSON, Professor of Metallurgy and Chairman of the department at Yale University, retires on 30 June, after more than 40 years on the faculty. Dr. Mathewson was responsible for founding and developing Yale studies in the science of metallurgy and metallography and has himself made many contributions to knowledge in this field.

MR. G. L. PERRY has left the Research Department of Imperial Chemical Industries, Ltd., to join the Physical Testing Department of the United Wire Works (Birmingham), Ltd.

MR. J. J. PICK has left Goodlass Wall and Lead Industries, Ltd., and joined the Research Department of the B.S.A. Co., Ltd., Birmingham.

MR. J. H. M. A. REID has been transferred from the Landore Works of Imperial Chemical Industries, Ltd., to the Technical Sales Department of the Company at Witton, Birmingham.

MR. J. G. RITCHIE, Chief Metallurgist of McPhersons, Ltd., Melbourne, is on a visit to England and expects to return to Australia, via the United States, in July.

MR. S. G. SALAMY has received the M.Eng.Sc. degree of the University of Melbourne. He intends to continue his researches, in the Mining Department of the University, on the flotation of oxidized minerals.

MR. J. W. SHEDDEN is now engaged in the Research Department of Murex Welding Processes, Ltd., Waltham Cross.

MAJOR P. LITHERLAND TEED has been elected a Fellow of the Royal Aeronautical Society. He has recently published a book "The Properties of Metallic Materials at Low Temperatures", which is the first of a series of monographs published under the authority of the Royal Aeronautical Society, and he has accepted an invitation from the Massachusetts Institute of Technology to lecture on "The Influence of Metallographic Structure on Fatigue".

MR. D. A. TEMPLE has recently been awarded the Ph.D. degree of Cambridge University.

Note : Will members (in addition to informing the Institute's administrative department of changes of address, occupation, &c.) kindly notify the Editor, *separately*, of all changes of occupation, appointments, award of honours and degrees, &c., as these matters interest their fellow-members.

JOINT ACTIVITIES

CAPPER PASS AWARDS

The Capper Pass Awards Adjudicating Committee has made the following awards for 1949, on behalf of the Councils of the Institution of Mining and Metallurgy and of the Institute of Metals :

MM. JEAN MATTER and MARCEL LAMOURDEDIEU (Société Centrale des Alliages Légers, Issoire (Puy-de-Dôme), France) £50 jointly for a paper on "The New Factory of the Société Centrale des Alliages Légers at Issoire (Puy-de-Dôme) for the Working of Light Alloys", published in the *Journal of the Institute of Metals*, 1949, vol. 75, August.

Mr. G. CHAD NORRIS (West African Gold Corporation, Ltd.) £50 for a paper on "Gold Concentration at the Amalgamated Banket Areas Reduction Plant", published in the *Bulletin of the Institution of Mining and Metallurgy*, 1949, No. 516, November.

Dr. E. SCHEUER (International Alloys, Ltd., Aylesbury, Bucks) £50 for a paper on "Modern Billet Casting, with Special Reference to the Solidification Process", published in the *Journal of the Institute of Metals*, 1949, vol. 76, October.

Messrs. H. L. TALBOT (Anglo-American Corporation of South Africa, Ltd.) and H. N. HEPKER (Central Research Laboratory, N'Kana, Northern Rhodesia) £50 jointly for a paper on "Investigations on the Production of Electrolytic Cobalt from a Copper-Cobalt Flotation Concentrate", published in the *Bulletin of the Institution of Mining and Metallurgy*, 1949, No. 514, September.

The Capper Pass Awards, which are made annually from a sum of £200 per annum placed at the disposal of the Councils of the Institution of Mining and Metallurgy and of the Institute of Metals by Messrs. Capper Pass and Son, Ltd., Bristol, are as follows :

(a) £100 per annum for one or more awards to authors of papers on some aspect of non-ferrous extraction metallurgy.

(b) £100 per annum for one or more awards to authors of papers relating to some process or plant used in the fabrication of non-ferrous metals contributed by persons engaged full time in industrial practice.

The Adjudicating Committee will meet early in 1951 to consider all papers published by both societies during the year 1950. Papers on extraction metallurgy should be offered to the Institution of Mining and Metallurgy and papers on fabrication to the Institute of Metals. Authors need not be members of either society, and may be resident in any country. MSS. should preferably be submitted in duplicate to either the Secretary, Institution of Mining and Metallurgy, Salisbury House, Finsbury Circus, London, E.C.2, or the Secretary, The Institute of Metals, 4 Grosvenor Gardens, London, S.W.1, from whom further particulars may be obtained.

NEWS OF LOCAL SECTIONS AND ASSOCIATED SOCIETIES

LOCAL SECTIONS COMMITTEE

The annual meeting of the Local Sections Committee was held at the offices of the Institute on Tuesday, 9 May 1950, Mr. H. W. G. Hignett being in the Chair. The Presidents and Honorary Secretaries of the Leeds Metallurgical Society and the Manchester Metallurgical Society were present by invitation.

The reports of the Sections for the past session were received and approved and recommendations were made (subsequently approved by the Council) for grants for the session 1950-51.

The Committee recommended that a representative of the Local Sections should be appointed to the Publication Committee. The Council later approved this proposal for a trial period of a year, and ruled that the Committee's representative should be its chairman for the time being (at present Mr. Hignett).

SOUTH WALES LOCAL SECTION

The final meeting of the 1949-50 session was held at University College, Swansea, on 2 May, when Brigadier J. GWYNNE MORGAN, C.B.E., T.D., M.B., B.S., gave a lecture on

Medical Aspects of Nickel Refining

The lecturer began by comparing the human body with a factory. He mentioned the skeleton, or girders, the respiratory system, or air-conditioning plant, the brain, or telephonic-communication system; and the other systems in their order. A brief outline was then given of the industrial diseases that attack the different parts of the human factory—the gases which affect the different sections of the respiratory system because of their different solubilities; the substances, like lead, which are ingested or absorbed and affect the blood and bones; and the chemicals which cause industrial dermatitis. The lecture, which was illustrated by slides, ended with a brief description of counter-measures.

OTHER NEWS

AUSTRALIAN INSTITUTE OF METALS

The third annual conference of the Australian Institute of Metals was held in Sydney and Port Kembla from 1 to 5 May 1950. A message of greeting was read from Mr. H. S. Tasker on behalf of the Institute of Metals.

The principal addresses were delivered to the conference by Mr. E. J. Raymond, the retiring Federal President, on "Some Metallurgical Observations of Welding" and by Professor N. F. Astbury on "Steel, the Physicists and the Electrical Engineer". Visits were paid to metal works in Sydney and to the important copper and steel works at Port Kembla.

Federal office bearers elected for 1950 are: *President*: K. E. Gerrard; *Vice-Presidents*: N. A. Pett and J. A. Stewart; *Hon-*

orary Secretary: R. S. Russell; *Honorary Treasurer*: E. B. Richardson. A new branch of the Institute has been formed in Brisbane, bringing the number of branches to six.

The 1951 meeting will be held in Adelaide.

"GENERAL NOTES ON THE PREPARATION OF SCIENTIFIC PAPERS"

As an outcome of one of the recommendations made at the Royal Society Scientific Information Conference held in 1948, the Royal Society's Information Services Committee has had prepared by a Sub-Committee under the Chairmanship of Professor G. L. Brown, C.B.E., F.R.S., a 26-page pamphlet entitled *General Notes on the Preparation of Scientific Papers*. This pamphlet is of a general character and is intended to assist authors of scientific papers, particularly those preparing a paper for the first time; it is not intended to replace the specific directions to authors issued by many scientific societies, but rather to supplement them with information of a more general character.

The pamphlet is published for the Royal Society by the Cambridge University Press, price 2s. 6d. (2s. 9d., post free).

APPOINTMENTS VACANT

A WELL-KNOWN COMPANY has the following appointments vacant in London:

ELECTRO-CHEMIST, with research and practical experience in the electrodeposition of metals, to take charge of development work in the plating field. Salary according to qualifications, but not less than £800 p.a.

EXPERIENCED RESEARCH WORKER, with good academic qualifications, for non-ferrous metallurgical investigations. Salary according to qualifications, but not less than £800 p.a.

CHEMIST, with good academic qualifications and several years' industrial chemical experience, preferably including catalysts, ceramics, or paints, required for development work in connection with applications of chemical products in industry in the U.K. and abroad. Salary according to qualifications, but not less than £700 p.a.

YOUNG GRADUATE, preferably with some research experience, for non-ferrous metallurgical investigations. Salary not less than £400 p.a.

Applications, giving full particulars, to: Box No. 720, T & G, 101 St. Martin's Lane, London, W.C.2.

THE BRITISH NON-FERROUS METALS RESEARCH ASSOCIATION has vacancies on its research staff for the following:

(1) An INVESTIGATOR, preferably with an honours degree in metallurgy or physics, to study stretcher-strain phenomena.

(2) An INVESTIGATOR, preferably with an honours degree in metallurgy, to carry out large-scale experimental work on the extrusion of lead.

(3) A RESEARCH ASSISTANT to assist in a study of hot-dip galvanizing.

The initial salary for the first two posts is up to £700 p.a., according to qualifications and experience, and some works' or research experience will be an advantage. The initial salary for the third post is up to £500 p.a., according to qualifications and experience. Applications should be sent to the Secretary, B.N.F.M.R.A., Euston Street, London, N.W.1.

CHEMICAL OR METALLURGICAL ENGINEERS, preferably with experience of high temperature and vacuum processes, are invited to apply for a vacancy on our research staff. The initial duties of the successful applicant will include the design and testing of a pilot plant and the study of its operations. Salary according to qualifications and experience. Apply in confidence to Secretary, Magnesium Elektron, Ltd., Clifton Junction, nr. Manchester.

INDUSTRIAL CHEMIST. A well-qualified and experienced industrial chemist, chemical engineer, or extraction metallurgist is required for development work and to study the technology and economics of certain high-temperature and vacuum metallurgical extraction processes. Salary according to qualifications and experience. Apply in confidence to Secretary, Magnesium Elektron, Ltd., Clifton Junction, nr. Manchester.

INORGANIC CHEMIST interested in research work and the development of processes from the laboratory stage to the large scale is required for a senior vacancy on our chemical research staff. Applicants should possess a 1st or 2nd Class Hons. degree in chemistry and have a few years of industrial experience. Salary according to qualifications and experience. Apply in confidence to Secretary, Magnesium Elektron, Ltd., Clifton Junction, nr. Manchester.

MAGNESIUM ELEKTRON, LTD., invites applications from qualified chemists with interest in research and development work for positions in its chemical research department. The subjects include high-temperature and vacuum and metallurgical extraction processes and

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the production of inorganic chemicals. Salaries in accordance with qualifications and experience. Applications giving full details, which will be treated in confidence, should be sent to the Secretary, Magnesium Elektron, Ltd., Clifton Junction, nr. Manchester.

METALLURGISTS. The Imperial Smelting Corporation, Ltd., requires metallurgists for the following appointments:

(a) **GROUP LEADER** to investigate research programmes concerned with pilot-plant scale extraction metallurgy, and to supervise teams engaged on these programmes. 1st or 2nd Class Honours Degree in Metallurgy and some years' experience in development work essential.

(b) **TECHNICAL ASSISTANTS** to organize and conduct investigations on metallurgical plant, and the supervision of general labour employed on these tests. Degree (preferably with Honours) or equivalent, essential. Industrial experience an advantage.

All positions are permanent and superannuated. Salaries according to qualifications and experience. Apply in writing to Manager, Personnel Department, Imperial Smelting Corporation, Ltd., Avonmouth, Bristol, quoting ref. IM/M.

PHYSICAL CHEMIST. A qualified and experienced physical and/or inorganic chemist is required to lead a small research and development group which will study some high-temperature and vacuum processes. Salary according to qualifications and experience. Apply in confidence to Secretary, Magnesium Elektron, Ltd., Clifton Junction, nr. Manchester.

THE ROYAL DENTAL HOSPITAL OF LONDON SCHOOL OF DENTAL SURGERY (University of London), 32 Leicester Square, W.C.2. Applications are invited for the appointment of Lecturer in Dental Metallurgy, as from 1 September 1950. The successful candidate will be required to organize one or two courses in Dental Metallurgy each year. Honorarium £100 per annum. Candidates for the appointment should forward six copies of their application and the names of three Referees not later than ten days after the appearance of this advertisement to the Dean, from whom further particulars may be obtained.

UNIVERSITY OF BIRMINGHAM, Department of Industrial Metallurgy. Applications are invited for the post of Research Fellow in Industrial Metallurgy to work in the field of melting and casting of metals. Candidates should possess adequate and suitable academic qualifications and experience in research. Salary £450 per annum.

Applications should be sent within a fortnight of the appearance of this advertisement to C. G. Burton, Secretary, The University, Birmingham 3.

NON-FERROUS METAL MELTING AND CASTING OF INGOTS FOR WORKING

This symposium on metallurgical aspects of the subject consists of the following six papers by recognised authorities and a full report of an important discussion held at a meeting attended by nearly 400 metallurgists. The papers are "Melting and Casting of Non-Ferrous Metals", by G. L. Bailey and W. A. Baker; "The Production of Refined-Copper Shapes", by R. H. Waddington; "Melting and Casting Aluminium Bronze Ingots for Subsequent Working", by A. J. Murphy and G. T. Callis; "The Application of Flux Degassing to Commercially Cast Phosphor-Bronze", by N. I. Bond-Williams; "The Melting and Casting of Brass", by Maurice Cook and N. F. Fletcher; "The Melting and Casting of Nickel Silver at the Works of Henry Wiggin and Co., Ltd.", by E. J. Bradbury and P. G. Turner.

A book for the practical metallurgist

Cloth. 8vo. 168 pages. 50 figures. 15s. or \$2.50 (7s. 6d. or \$1.50 to members), post free.

THE INSTITUTE OF METALS
4 GROSVENOR GARDENS, LONDON, S.W.1

July 1950

THE INSTITUTE OF METALS

President :

H. S. TASKER, Esq., B.A.

Secretary :

Lieut.-Colonel S. C. GUILLAN, T.D.

Editor :

N. B. VAUGHAN, M.Sc., F.I.M.

Assistant Secretary :

Major R. E. MOORE

Administrative and Editorial Offices:

4 GROSVENOR GARDENS, LONDON, S.W.1

Telephone :

SLOANE 5928 & 6233

INSTITUTE NEWS AND ANNOUNCEMENTS

**AUTUMN MEETING, BOURNEMOUTH,
18-22 SEPTEMBER 1950.**

VISITS

Monday, 18 September

Admiralty Central Metallurgical Laboratory, Emsworth

The Laboratory performs four major functions, all of which are interrelated. The first of these is to provide scientific control of metallurgical operations in the Engineering Departments of H.M. Dockyards and the Fleet Air Arm repair yards at home and abroad. To assist with this work, five smaller laboratories, acting in concert with the C.M.L., are located at the principal yards. The scope of this control work covers the production of steel, cast iron, and non-ferrous alloys in the foundries; moulding-sand control; fuel and refractories; supervision of physical and mechanical testing; heat-treatment and survey of pyrometric equipment; checks of welders and welding; flaw detection by X-ray, gamma-ray, and fluorescent techniques; supervision of acid and electrolytic cleaning, electroplating, and metal spraying.

The second function of the C.M.L. is to provide an advisory service on metallurgical (including corrosion) matters for Admiralty technical departments and for the Fleet and Shore Establishments. This involves the investigation of service failures; trials of new materials or processes, and the adaptation to naval service of those already developed for other industrial purposes; and advice on the choice of materials for new designs of any item required in the Service.

Thirdly, the C.M.L.—besides providing advice on corrosion matters—is responsible for all the major corrosion investigations undertaken by the Admiralty. In addition to fully-equipped laboratories for this purpose, it possesses nearby in Chichester Harbour extensive facilities for conducting exposure trials in marine environments, consisting of rafts for complete immersion of specimens in the sea, half-tide racks for providing conditions of alternate wetting and drying, and racks for atmospheric exposure.

The fourth major commitment consists of research and development work on the prevention of marine fouling. This involves a

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wide range of laboratory work, including biological, chemical, and paint technological studies. In some aspects, however, it is inseparable from corrosion and protection studies and requires certain similar facilities, such as rafts for sea immersion.

The Establishment itself, which is accommodated in a converted private house (Emsworth House), provides, with outbuildings, approx. 28,000 sq. ft. of floor space for metallurgical, corrosion, chemical, and biological laboratories, dark rooms, workshops, stores, and office accommodation. It will be the aim to exhibit typical examples covering as many as possible of the activities of the laboratory previously mentioned, and the following is a brief guide to the main items that will be on view.

Investigations concerned with the repair of propellers, including the determination of the transformation rates of high-tensile brasses; corrosion-fatigue and stress-corrosion of welded propeller materials; crack-propagation resistance in steels at various temperatures; destannification of phosphor bronzes in steam atmospheres; methods of flaw detection, including the use of radium and methods of protecting personnel; an exhibition of typical metallurgical service failures received in the laboratory and failures under investigation; methods of measuring the thickness of materials and coatings; electrolytic de-rusting; and specialized investigations for Fleet Air Arm repair yards.

Various forms of accelerated rotor apparatus for determining the resistance of materials and coatings to high-speed water flow; equipment for circulating sea-water at high speed through test pipes; a unit for testing condenser design from a corrosion aspect under controlled conditions of water speed, flow characteristics, degree of aeration and temperature; the effect of scale in condenser tubes on heat transfer, and methods for its removal; the study of surface preparation, pre-treatment, and protection against corrosion of mild steel and aluminium alloys; the study of polarization phenomena and corrosion inhibitors; and an exhibition of typical service failures due to corrosion.

The culture of marine organisms for the biological assessment of anti-fouling paints; an aquarium, showing marine organisms found in Chichester Harbour; a demonstration of fouling micro-organisms; a leaching-rate test for evaluating anti-fouling paints; the laboratory-scale production of anti-fouling paints; and the preparation of anti-fouling organic poisons.

Members arriving for the visit in the morning will be able to inspect some of the test panels on the exposure sites in Chichester Harbour. These will illustrate investigations, on mild steel and aluminium alloys, of pre-treatment processes and paint protection against corrosion and fouling; the protection of mild steel by metal coatings; and the determination of the corrosion-resistance of stainless steels and propeller alloys.

Harland and Wolff, Ltd., Ship-Repairing and Engineering Works,
Southampton

The primary business is that of ship-repairing and general engineering, and all classes of ships are dealt with, including passenger liners, cargo vessels, naval ships, and special craft of every description. Special facilities are available for dealing with the largest types of main and auxiliary Diesel machinery, as well as the more usual boilers, turbines, and reciprocating engines, and all

kinds of auxiliaries. The average number of workpeople is 3000. The factories are chiefly powered by electrical machines, and also contain compressed-air, hydraulic, and electrical services necessary for the carrying on of the Company's activities.

The plant and equipment in the various shops is as follows : *Boiler Shop* : plate-bending rolls ; punching, shearing, planing, drilling, grinding, and welding machinery ; and a 350-ton hydraulic flanging press. *Engineering Shops* : numerous lathes of all descriptions ; boring and turning mills ; planing, drilling, milling, boring, shaping, screw-cutting, and grinding machinery of every type ; and there are special shops for finishing brass and non-ferrous work and for tool-making. *Electricians' Departments* : machinery for the manufacture and repair of dynamos and electric motors, including coil- and tape-winding machines, impregnating stove, &c. *Smithy* : pneumatic hammers from 5 to 30 cwt. capacity ; shingling furnace ; chain-annealing furnace ; chain-testing machine ; smiths' hearths. *Plumbers' and Coppersmiths' Departments* : oil-fired furnaces ; punching and shearing machines ; pipe-bending, screwing, and welding machines. *Sheet-Metal Shop* : punching, shearing, folding, and bending machines ; tinning plant ; pickling and scouring tanks ; and polishing machines. *Woodworkers' Shops* (Joiners' Shop ; Patternmakers' Shop) : planing, sawing, moulding, and jointing machinery ; wood-working lathes ; sanding machinery ; veneering press. A section of this department is devoted to french polishing and cellulose-spray polishing. *Shipwrights' Shop* : plant for the manufacture of gratings, spars, deck-fittings, blocks, &c., and for the repair of boats, rafts, and buoyant apparatus. *Foundries* : two overhead cranes ; cupolas and crucibles for the manufacture of iron and non-ferrous castings. *Sailmaking and Upholstery Departments* : sewing and other machinery for the repair and manufacture of all kinds of work in canvas and furnishing fabrics. *Paint Shop* : deals with all paint-work, glass-work, and signwriting. *Instrument Shop* : equipment for the repair and testing of all kinds of instruments.

In addition, there are testing machines of various kinds, and a very comprehensive installation of portable plant such as welders, compressors, electric generators, &c.

Pirelli-General Cable Works, Ltd., Eastleigh

The Company manufactures all types of bare and insulated electric wires and cables, ranging from the smallest flexible wires to the largest cables for the highest voltages used. The works are at Eastleigh and Southampton. The visit of members of the Institute of Metals will be to the Eastleigh works, at which are manufactured bare copper conductors, single and stranded ; cables insulated with paper or varnished cambric for power transmission ; and cables insulated with paper for telecommunication purposes.

The Rod-Rolling Plant converts electrolytic copper wire-bars into $\frac{1}{4}$ -in. rod (or other sizes as may be required) ; the rod is then drawn into wire in the Wire-Drawing Department, to any size required in the manufacture of cables or overhead lines.

In the Chemical Laboratory members will see the spectroscopic analysis of metals and other apparatus.

A reliable sheath is of the utmost importance in paper-insulated cables, particularly for oil-filled cables where there is an internal pressure of oil and for telephone cables which are specially

susceptible to moisture. The old hydraulic press had many disadvantages and could not be relied on to produce a consistently satisfactory sheath. This led to the development of the Pirelli-General patented continuous lead-extrusion press for cable sheathing, which has been so successful that considerable numbers have been made or are on order for cable-makers in England, Austria, Belgium, Canada, Denmark, France, Japan, Palestine, Sweden, Switzerland, and the United States of America. These presses are generally driven by a Witton Ward-Leonard set and motor.

The Pirelli patented oil-filled cable for super-tension work first made possible the use of 132,000 V. on the old C.E.B. grid; at the time when it was introduced there was no cable which could work at such a pressure. It is likely that before long these cables will be made for 275,000 V. (they have already worked at 220,000 V.); they have often an advantage over other types for voltages as low as 33,000.

Telephone cables contained in a stainless steel welded sheath are made, and used to a considerable extent by the Post Office for overhead transmission because the cable is self-supporting, may be made in longer lengths, is not subject to corrosion, and is proof against gun-shot.

Ordinary paper-insulated, lead-sheathed cables for power purposes are made in a large variety of sizes and types. There is also a wide range of telephone cables. The Company lays power cables and telephone cables, and designs, supplies, and erects overhead transmission lines and large towers, such as the ones for the television link between Birmingham and London, for which it was responsible. The headquarters of these departments are at Eastleigh. At Eastleigh are also made drums and cases for both works for transporting cables, and also various accessories for power and telephone cables.

John I. Thornycroft and Co., Ltd., Southampton

The Company's original shipbuilding and marine engineering works were at Chiswick, on the River Thames, but in 1904 the increasing size of destroyers and other ships necessitated the removal of the works to Woolston, Southampton. The Southampton organization comprises a full range of facilities at Woolston for the design, construction, and fitting out of warships and passenger and cargo ships and their machinery up to about 5000 tons deadweight. In addition, there are Repair Departments in Southampton Docks and at Northam, in which repairs are carried out on all classes and sizes of ships from yachts to the largest passenger liners in service.

The Woolston Works, which members of the Institute of Metals will visit, include building berths, prefabrication berths, plate shops, mould loft, machine shops, engine erecting shops, boiler shops, boat shops, sheet-metal department, joiners' shops, ships' furnishing and upholstery shops, ferrous and non-ferrous foundries, and a metallurgical laboratory.

Ships building at the moment include a destroyer of the latest class for H.M. Government, a passenger ship for Norwegian owners, two river boats, a number of yachts, and a floating dock.

In the machinery shops a wide range of steam turbines for marine and land installations are under construction, in addition to oil engines and numerous general engineering products. The

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Repair Department is operated in close conjunction with the Woolston works.

During the last war the production of the Woolston yard was devoted entirely to naval vessels of various types, including destroyers, sloops, corvettes, frigates, minelayers, landing craft, and special-service vessels. During the same period 4460 vessels of all kinds were repaired, converted, or refitted by Thornycroft's Southampton repair establishments which, excluding vessels flying the white ensign, totalled over twelve million tons gross of shipping.

Vickers-Armstrongs, Ltd. (Aircraft Section), Woolston and Eastleigh

A tour of the works at Woolston will cover the manufacture of plate details, sheet metal components, and assemblies, and all processes, including spot-welding, appertaining to the manufacture of aircraft parts. The overhaul of Spitfires and amphibian aircraft will be seen.

At Eastleigh, members will see the overhaul of Spitfires, Seafires, and Wellingtons. It is hoped that the weather will permit the test flight of a machine at this unit, where all the Spitfires used in the Battle of Britain were actually flown in test.

Wednesday, 20 September

Admiralty Materials Laboratory, Holton Heath

The Laboratory is a recently-formed research establishment in which the Royal Naval Scientific Service aims to concentrate most of its longer-range investigations so far as they are concerned with chemistry, metallurgy, and chemical engineering. The establishment comprises a number of sectional laboratories, each of which deals with its own aspect of the work, and it also includes a General Chemical Division where specialist techniques are available for the assistance of the different sections.

The visit of members of the Institute of Metals will be primarily to the Metallurgical Section, which is well equipped for general metallographic work, small-scale melting, heat-treatment, and mechanical testing, and in which several investigations of fairly wide scope are in progress. In addition, a large high-temperature creep and fatigue laboratory is being built up, and is already partially in operation. A considerable range of types of high-temperature testing equipment can be seen, including some novel ones developed in the laboratory.

In the General Chemical Division the equipment to be seen includes an electron microscope and X-ray diffraction, spectrographic, and spectrophotometric apparatus. Examples will be shown of the application of these techniques to some current materials problems in metallurgical and related fields.

If time permits, it may be possible to include a brief visit to a Crystal Growing Section, where large crystals of water-soluble materials are being grown for various service applications. It is considered that the experimental work in question has features of indirect interest to metallurgists.

Airspeed, Ltd., Christchurch

This is an associated company in the de Havilland group, and started near York in 1931. In 1934 it was transferred to Portsmouth, where the head office and main manufacturing centre

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remain. During the last war a shadow factory was built near Christchurch, and this was managed by Airspeed, Ltd. This factory, which is the one to be visited by members of the Institute of Metals, is now the main assembly plant for the Company. All the detail fabrication is carried out at Portsmouth, and the various aircraft sections are transported to Christchurch for final assembly and later test.

At the Christchurch works are all the firm's design staff, the drawing offices, the research section, and the experimental department. When, during the latter part of the war, design work was started on the Ambassador inter-city airliner, which is now the main product of the Company, the design and experimental teams were installed at Christchurch and the two prototype aircraft were built almost in their entirety in these works. The experimental department is now turning its attention to newer designs, and the capacity of the large Christchurch factory is largely devoted to the production of 20 Ambassador airliners for the British European Airways Corporation.

The Ambassador, which is a 47/49-seater, twin-engined, medium-stage airliner, was originally planned as a replacement for the ubiquitous Dakota. The aircraft are pressure-conditioned to provide sea-level atmosphere in the cabin at 10,000 ft. and air at the equivalent of 8000 ft. when flying at 20,000 ft. The machine has a tricycle twin-wheeled undercarriage with a steerable nozewishell, thermal de-icing, and braking propellers. The aircraft has remarkable safety qualities. The second prototype was the first twin-engined machine to take off with one engine.

Wellworthy Piston Rings, Ltd., Ringwood and Lymington

The firm was started in World War I, as South Coast Garages, when it made shells and the tools and machinery used in the production of piston rings. In 1922 Wellworthy came into being and took over from South Coast Garages. Since then the business has grown, so that during the last war it operated plants in Lymington (2 factories), Ringwood, Salisbury (2 factories), and Abingdon, and employed 7000 people in the manufacture of aircraft pistons and rings for all the principal engines, e.g. the Rolls-Royce, Bristol, Napier, de Havilland, &c.

The Company is now engaged in the production of pistons, piston rings, valve seats, liners, &c., and also manufactures its own centrifugal and sand castings. Castings are produced at Ringwood, where their manufacture is controlled by a laboratory.

The head office and a piston-ring factory are at Lymington, and employ 900 work-people (the total organization comprises about 3000).

Members of the Institute of Metals will visit the works both at Ringwood and Lymington.

METALLURGICAL ENGINEERING COMMITTEE

Dr. A. R. E. SINGER, lecturer in the Department of Industrial Metallurgy, Birmingham University, has been co-opted to serve on the Metallurgical Engineering Committee.

ARTICLES OF ASSOCIATION

At an Extraordinary General Meeting of the Institute held at 4 Grosvenor Gardens, London, S.W.1, on Tuesday, 27 June 1950, the following Special Resolution was passed :

Resolution

That the provisions of Clauses 5, 6, 7, 8, 9, 10, 15, 17, 32, 38, 42, 44, 46, 57, 58, 59, 63, and 64 of the Articles of Association of the Institute be altered as follows :

(i) By the insertion in Clause 5 thereof of the words " Junior Members ", after the words " Ordinary Members ".

(ii) By the substitution in the third paragraph (relating to " Ordinary Members ") of Clause 6 thereof of the words " non-ferrous metallurgy " for the words " the metal trades or with the application of non-ferrous metals and alloys, or engaged in their scientific investigation ".

(iii) By the addition to Clause 6 thereof after the paragraph relating to " Ordinary Members " of the following new paragraph : " *Junior Members* shall (not being less than twenty-one years of age) be admitted and retained as such within such limits of age as shall be determined from time to time by the Council and/or provided in the Bye-Laws. They shall be either (a) persons engaged in the manufacture, working or use of non-ferrous metals and alloys; (b) persons of scientific, technical or literary attainments connected with or interested in non-ferrous metallurgy; or (c) pupils or assistants of persons qualified for Ordinary Membership, whether such persons are members or not. Junior Members shall not be eligible for election on the Council nor shall they be entitled to vote at the meetings of the Institute or to nominate candidates for Ordinary Membership."

(iv) By the substitution in the fourth paragraph (relating to " Associate Members ") of Clause 6 thereof of the words " Associate Members shall not be eligible for election on the Council, nor shall they be entitled to vote at meetings of the Institute, or to nominate candidates for Ordinary, Junior or Student membership " for the words " An Associate Member shall not be entitled to vote at meetings of the Institute or to nominate candidates for Ordinary or Student membership ".

(v) By the insertion in the fifth paragraph (relating to " Student Members ") of Clause 6 thereof of the words " and allied sciences " after the words " students of metallurgy " and of the word " Junior " after the words " candidates for Ordinary ".

(vi) By the insertion in the Form " A " in Clause 7 thereof of the words " Date of Birth " below the word " Qualification ".

(vii) By the substitution in the Form " A " in Clause 7 thereof of the words " the above-named applicant " for the words " the said "; and of the words " Signature of Applicant " for the words " Name of applicant in full "; and of the words " Private Address " for the word " Address "; and of the words " Appointment and Business Address " for the words " Business or Profession ".

(viii) By the insertion in Clause 7 thereof of the words " if any " after the words " entrance fee ".

(ix) By the cancellation of Clause 8 and of the substitution of the following new clause therefor: " 8. Applications for membership as Ordinary, Junior, Associate or Student Members shall be submitted to the Council for approval. Before election the names of all applicants shall be exhibited at the offices of the Institute for inspection by members, and published in any other manner as may from time to time be prescribed by the Council. An objection to any candidate whose name is so exhibited or notified to members shall be made in writing to the Secretary within fourteen days of the date when the list shall first be exhibited or published, and such objection shall be brought to the attention of the Council, which shall determine the course of action to be taken. Non-election shall not

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necessarily prejudice the candidate for election concerned in any future application for election."

(x) By the cancellation of Clause 9 and the substitution of the following new clause therefor: "9. (a) Unless and until otherwise determined by the Council or provided in the Bye-Laws the subscription of each Ordinary Member shall be four guineas per annum, of each Junior Member and Associate Member shall be two pounds and fifteen shillings per annum, and of each Student Member shall be one pound and fifteen shillings per annum. At the discretion of the Council, Ordinary Members, Junior Members and Student Members may be required to pay an Entrance Fee."

"(b) Rules and/or regulations may be made by the Council from time to time for the transference of members from one class of membership to another class. The fee, if any, to be paid on any such transfer shall be such as the Council may from time to time prescribe. The Council may, in fixing such sum, take into consideration any prior payment of entrance fees by Junior Members and Student Members."

"(c) Subscriptions shall be payable on election and subsequently in advance on the first day of July in each year, or otherwise as shall be determined from time to time by the Council and/or provided in the Bye-Laws."

"(d) No entrance fee or subscription shall be payable in the case of Honorary Members or Fellows."

(xi) By the omission from Clause 10 thereof of the words "in separate columns" and the words "and names of his Sponsors if an Ordinary or Student Member".

(xii) By the substitution in sub-clause (d) of Clause 15 thereof of the word "twelve" for the word "six".

(xiii) By the cancellation of sub-clause (f) of Clause 15 and the substitution of the following new sub-clause therefor: "Junior, Associate or Student Membership shall cease on the member attaining the prescribed limit of age".

(xiv) By the substitution in Clause 17 thereof of "15 (e)" for "15".

(xv) By the substitution in the second paragraph of Clause 32 thereof of the words "the British Isles or elsewhere" for the words "the British Isles, in British Dominions overseas or in foreign countries".

(xvi) By the addition before the last paragraph of Clause 32 thereof of the words:

"To appoint and remove such and so many representatives of allied societies or other bodies interested in the promotion of the science and practice of non-ferrous metallurgy as the Council shall think fit, to attend meetings of the Council for purposes of liaison, provided that such persons shall not by virtue of such appointment be entitled to vote either at a meeting of the Council or at a General Meeting of the Institute".

"To appoint and remove, as the Council shall think fit, such and so many members of the Institute as Honorary Corresponding Members in the British Commonwealth and colonies or in foreign countries to advise the Council on the promotion of the objects of the Institute in their respective countries".

(xvii) By the substitution in Clause 38 thereof of the words "four-fifths" for the word "all".

(xviii) By the insertion in Clause 42 thereof of the letter "(a)" before the words "The President".

(xix) By the addition to Clause 42 thereof of the sub-clause "(b) The Council may nominate Chairmen to preside at General Meetings of the Institute or meetings held jointly with other bodies for the discussion of scientific and technical matters only, but at such General Meetings of the Institute no Resolution shall be discussed or put to the meeting".

(xx) By the insertion in Clause 44 thereof of the words "and shall be conducted in accordance with the provisions of the Companies Act 1948 or any amending Act." after the words "United Kingdom".

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(xxi) By the substitution in Clause 46 thereof of the words "Twenty-one" for the word "Seven".

(xxii) By the insertion in Clause 46 thereof of the words "in writing" after the words "shall be given".

(xxiii) By the omission from Clause 46 thereof of the word "general" after the words "state the".

(xxiv) By the insertion in Clauses 57, 58 and 59 thereof of the words "or otherwise" after the words "by bye-laws".

(xxv) By the omission from Clause 63 thereof of the words "And no person other than a Member of Council shall be entitled to inspection thereof without the consent of the Council".

(xxvi) By the insertion in Clause 64 thereof of the words "or by any amending Act," after the words "Companies (Consolidation) Act, 1908".

ELECTION OF ORDINARY MEMBERS AND STUDENT MEMBERS

The following 15 Ordinary Members and 9 Student Members were elected on 28 June 1950 :

As Ordinary Members

BARTLETT, Kenneth M., Director of Research, Thompson Products Inc., 23555 Euclid Avenue, Cleveland 17, O., U.S.A.

DE BARR, Albert Edward, B.Sc., Leader of Physics Division, Research Laboratories of Elliott Brothers (London), Ltd., Elstree Way, Boreham Wood, Hertfordshire.

DELBART, Georges Robert, D.Sc., Director, Institut de Recherches de la Sidérurgie, 185 rue Président Roosevelt, St. Germain-en-Laye, France.

DHAVERNAS, Jean M., President, Centre d'Information du Nickel, 41 avenue de Friedland, Paris (8^e), France.

FLETCHER, John Thomas, Metallurgist, Clarke, Chapman and Co., Ltd., Victoria Works, Gateshead 8, Co. Durham.

HUGONY, Eugenio, Dr.Ing., V. Direttore, Istituto Sperimentale Metalli Leggeri, via della Posta 8/10, Milano, Italy.

JARLEBORG, Martin Holger, Head of Laboratory, Fagersta Bruks A.B. Dannemoraverken, Osterbybruck, Sweden.

JUETT, Douglas, Supervisor, Heat Treatment Department, Addressograph-Multigraph, Ltd., 50 Oxgate Lane, Cricklewood, London, N.W.2.

LLOYD, Lowell T., M.S., Graduate Student, Department of Metallurgy, Carnegie Institute of Technology, Schenely Park, Pittsburgh 13, Pa., U.S.A.

MACKENZIE, David, 7 Waterside Street, Irvine, Ayrshire.

MAYBREY, (Mrs.) Mary Clarke, Managing Director, H. J. Maybrey and Co., Ltd., Worsley Bridge Road, London, S.E.26.

MEUSSNER, Russel A., M.S., Graduate Student, Department of Metallurgy, Carnegie Institute of Technology, Schenely Park, Pittsburgh 13, Pa., U.S.A.

SIGNORA, Mario, Director of Testing and Research Laboratory, Acciaierie e Ferriere Lombarde Falck, via Mazzini 23, Sesto S. Giovanni, Milano, Italy.

THOMPSON, Thomas, M.Sc., Director, Clarke, Chapman and Co., Ltd., Victoria Works, Gateshead 8, Co. Durham.

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WINSTON, John Stanton, A.B., M.A., Instructor, Department of Metallurgical Engineering, Missouri School of Mines and Metallurgy, Rolla, Mo., U.S.A.

As Student Members

BALLASS, John Thomas, A.S., Student of Metallurgy, Missouri School of Mines and Metallurgy, Rolla, Mo., U.S.A.

BRUNNER, Hanus, Student of Metallurgy, Battersea Polytechnic, Battersea Park Road, London, S.W.11.

CASSAVETES, Nicholas John, Jr., Student of Metallurgy, Missouri School of Mines and Metallurgy, Rolla, Mo., U.S.A.

FISCHER, Peter, Student of Metallurgy, Eidgenössische Technische Hochschule; temporarily at High Duty Alloys, Ltd., Slough, Bucks.

HEBERT, Robert Earl, Student of Metallurgy, Missouri School of Mines and Metallurgy, Rolla, Mo., U.S.A.

LOVEDAY, Kenneth William, Student of Metallurgy, Northampton Polytechnic, St. John Street, London, E.C.1.

MASON, Henry Robert, Student of Metallurgy, University of Melbourne, Carlton N.3, Victoria, Australia.

PERKINS, Raymond Frank, Laboratory Assistant, British Non-Ferrous Metals Research Association, Euston Street, London, N.W.1.

THORNTON, Philip Challis, Metallurgical Chemist, Chemical Laboratory, Plessey Co., Ltd., Vicarage Lane, Ilford, Essex.

DISCUSSION OF PAPERS

In order to assist the Committee responsible for arranging the programmes of the General Meetings of the Institute, will all members who are prepared to discuss orally any of the papers published in the *Journal* please inform the Secretary as soon as possible.

It is hoped that such information will enable programmes to be arranged which will secure well-attended and lively discussions.

PERSONAL NOTES

DR. N. P. ALLEN has been elected a Member of Council of the British Iron and Steel Research Association.

PROFESSOR J. H. ANDREW, who has been Professor of Metallurgy at Sheffield University since 1932, is retiring for reasons of health at the end of the summer.

DR. BANI R. BANERJEE has been awarded the degree of Doctor of Engineering of Yale University. Dr. Banerjee, who was formerly on the faculty of the Department of Metallurgical Engineering, Illinois Institute of Technology, is at present research engineer in the Engineering Research Division of Standard Oil Company, 910 South Michigan Avenue, Chicago, Ill.

NEWS AND ANNOUNCEMENTS

MR. W. J. BAYLEY has left Imperial Chemical Industries, Ltd., Metals Division, Birmingham, to take up the position of head chemist at the Melton Works of Capper Pass and Son, Ltd.

MR. I. M. BIDGOOD has left the Ministry of Supply and is now metallurgist to George Kent, Ltd., Resolven, Glamorgan.

DR. J. W. CUTHBERTSON has been elected Chairman of the London Centre of the Electrodepositors' Technical Society.

MR. JOHN GARDOM has been elected National President of the National Technical Trades Societies.

MR. S. K. GHASWALA, chartered engineer, of Bombay, has been admitted to membership of the American Society for Engineering Education (member), American Society of Civil Engineers (associate member), Society of Engineers, London (associate member).

DR. W. HUME-ROTHERY received on 24 June the Bakhuis Roozeboom Gold Medal of the Koninklijke Nederlandse Akademie van Wetenschappen. This medal, which was founded in 1911, has been awarded only five times previously.

MR. J. A. PARDOE has left D. Napier and Son, Ltd., Liverpool, and taken up an appointment as metallurgist with the Ministry of Supply, Department of Atomic Energy, at their Springfields Factory, Salwick, near Preston.

MR. P. C. L. PFEIL, who is now in the Metallurgy Division of the Atomic Energy Research Establishment, Harwell, has recently received the degree of Ph.D. of Birmingham University.

MR. V. A. PHILLIPS, who is at present a member of Dr. Orowan's team at the Cavendish Laboratory, Cambridge, has been awarded the degree of Doctor of Engineering by Yale University, U.S.A., as a result of graduate studies carried out there in the Hammond Metallurgical Laboratory.

DR. J. F. THOMPSON, President of the International Nickel Company of Canada, Ltd., and an Honorary Member of the Institute, was awarded the honorary degree of D.Sc. by Columbia University on 8 June.

DEATH

The Editor regrets to announce the death of :

MR. ROOSEVELT GRIFFITHS, M.Sc., F.I.M., Senior Lecturer in Metallurgy at University College, Swansea, on 24 June. Mr. Griffiths served as a Member of Council from 1940 to 1945 and as a Vice-President 1945-48. He was Chairman of the Swansea (now South Wales) Local Section in 1934-36, and its Secretary for a number of years.

Note : Will members (in addition to informing the Institute's administrative department of changes of address, occupation, &c.) kindly notify the Editor, *separately*, of all changes of occupation, appointments, award of honours and degrees, &c., as these matters interest their fellow-members.

JOINT ACTIVITIES

JOINT COMMITTEE FOR NATIONAL CERTIFICATES IN METALLURGY

Report for the Year 1948-49

1. Schemes approved by the Joint Committee have been in operation during 1948-49 at the following Technical Colleges :

(a) *Ordinary National Certificate*.—Battersea Polytechnic, London; Birmingham Central Technical College; Chesterfield Technical College; Corby Monotechnic Institute; Coventry Technical College; Cumberland Technical College, Workington; Derby Technical College; Enfield Technical College; Leeds College of Technology; Merchant Venturers' Technical College, Bristol; Middlesbrough, Constantine Technical College; Neath Mining and Technical Institute; Newport Technical College, Monmouthshire; Nottingham and District Technical College; Rotherham College of Technology; Scunthorpe Technical School; Shotton, Deeside Technical Institute; Smethwick, The Chance Technical College; Stoke-on-Trent, North Staffordshire Technical College; Swansea Technical College; Wednesbury, County Technical College; Wolverhampton and Staffordshire Technical College. *Contributory Centres*.—Bordesley Green Technical School and Moseley Grammar School Evening Institute (Contributory Centres to Birmingham Central Technical College); Dudley and Staffordshire Technical College (Contributory Centre to Wednesbury, County Technical College); Nottingham People's College Senior Technical Institute (Contributory Centre to Nottingham and District Technical College).

(b) *Higher National Certificate*.—Battersea Polytechnic, London; Birmingham Central Technical College; Chesterfield Technical College; Coventry Technical College; Middlesbrough, Constantine Technical College; Rotherham College of Technology; Rugby College of Technology; Smethwick, The Chance Technical College; Swansea Technical College; Wednesbury, County Technical College; Wolverhampton and Staffordshire Technical College.

2. Final Examinations of the course for the Ordinary National Certificate have been held in 1949 at 21 Technical Colleges, and for the Higher National Certificate at 10 Technical Colleges, for candidates who satisfied the conditions laid down in Ministry of Education Rules 111, under which the scheme is operated.

3. The Committee is pleased to report that :

(a) 106 candidates have qualified for the award of an Ordinary National Certificate in Metallurgy, and 50 candidates have qualified for the award of a Higher National Certificate, as a result of Final Examinations held in 1949.

(b) The records of a further 2 candidates for the Ordinary National Certificate have been approved by the Joint Committee, subject to the fulfilment of certain conditions.

(c) 2 candidates for the Ordinary National Certificate and 9 candidates for the Higher National Certificate who entered the Final Examinations in 1948 and whose records were approved by

NEWS AND ANNOUNCEMENTS

the Joint Committee, subject to certain provisions, have qualified for the award of Certificates in 1949.

(d) Distinctions have been gained by 44 candidates who have shown an exceptional grasp of their subjects, indicating a high degree of training and knowledge in the particular subject in which the Distinction has been gained.

4. Comparative figures of entries and successful candidates for the four years since the institution of the Scheme for National Certificates in Metallurgy are as follows :

(i) *Ordinary National Certificate :*

Year	Technical Colleges	Number of Candidates	
		Entered	Awarded Certificates
1946	4	28	23
1947	11	102	69
1948	15	123	74
1949	21	222	107*

* Including 2 candidates whose Certificate was withheld in 1948.

(ii) *Higher National Certificate :*

Year	Technical Colleges	Number of Candidates	
		Entered	Awarded Certificates
1946	...	...	...
1947	2	22	18
1948	8	38	22
1949	10	74	59†

* Including 9 candidates whose Certificate was withheld in 1948.

5. Prizes have been awarded in 1949 to 48 successful candidates who have shown particular merit in the Final Examinations, from the Prize Fund established by the Iron and Steel Institute, the Institution of Mining and Metallurgy, and the Institute of Metals for the purpose.

6. The Committee has noted with pleasure the increase in the number of Technical Colleges holding Final Examinations in 1949, and in the number of candidates entering the examinations; also that there is a continued increase in the number of students entering the first and second years of the courses.

7. The Joint Committee also welcomes the setting up of a Committee and the institution in 1948-49 of a Scheme for the award of National Certificates in Metallurgy in Scotland.

NEWS OF LOCAL SECTIONS AND ASSOCIATED SOCIETIES

MANCHESTER METALLURGICAL SOCIETY

The Annual Joint Meeting of the Institute of Metals and the Manchester Metallurgical Society will be held at the Engineers' Club, Albert Square, Manchester, on Wednesday, 8 November. The President of the Institute (Mr. H. S. Tasker) hopes to be present and to take the Chair.

OTHER NEWS

"METALS IN THE SERVICE OF MANKIND"

A special exhibition "Metals in the Service of Mankind" is now in progress at the Science Museum, South Kensington, and will remain open until 30 September. (10 a.m. to 6 p.m. on weekdays and 2.30 to 6 p.m. on Sundays. Admission free.)

The exhibition, which is designed to show the ever-increasing part which metals and their alloys play in modern civilization, has been organized by the Institution of Metallurgists in conjunction with the Science Museum. Research and development associations and a number of individual firms have contributed the majority of the exhibits.

In addition to the stands which show the extraction, working, and applications of all the common metals and some of the rarer ones, there are exhibits dealing with methods of metal finishing, electrodeposition, welding, and powder metallurgy. A metallurgical laboratory and a metal-testing section demonstrate the various tests to which metals and alloys are subjected and the techniques which are adopted to ascertain their composition and properties.

In connection with the exhibition, an excellent handbook has been produced, which, besides giving a guide to the various stands, contains a 120-page account of "The Story of Metals". This is available from the Science Museum or from the Institution of Metallurgists, 4 Grosvenor Gardens, S.W.1, price 1s. (by post 1s. 2d.).

ASSOCIAZIONE ITALIANA DI METALLURGIA

The 4th National Congress of the Associazione Italiana di Metallurgia will be held in Florence from 28 September to 1 October 1950. Discussions are planned on "Pure Metals" and "Metallurgical and Engineering Aspects of Machining, with Removal of Cuttings", as well as on individual papers.

The Associazione Italiana di Metallurgia has established a Foundation in honour of the prominent Italian metallurgist, Luigi Losana, who died in 1947. The Foundation will have at its disposal a Luigi Losana gold medal which will be awarded at least once every two years to Italian or foreign research workers who have made outstanding contributions to the knowledge of metals.

In the year preceding each award the Council of the Foundation will name the country whose scientist is to be honoured, and consult with the appropriate scientific societies in that country as to a suitable candidate.

EAST MIDLANDS METALLURGICAL SOCIETY

The inaugural meeting of this society was recently held at the Nottingham and District Technical College, when officers and committee were elected and Dr. H. M. Finnieston gave a lecture on "Some Problems in Metallurgical Research at Harwell". There was an attendance of 75, and the present membership of the society has already reached that number.

The objects of the society are to arrange lectures, visits, discussions, and an annual dinner in all the main cities and towns in the East Midlands area, in rotation.

The officers and committee are: *President*: C. H. Bulleid, O.B.E., M.A., M.I.Mech.E., A.M.I.C.E.; *Vice-President*: T.

NEWS AND ANNOUNCEMENTS

Parry, F.I.M.; *Hon. Treasurer*: R. Bingham, L.I.M.; *Committee*: L. H. Baxter, B.Sc., A.I.M. (Grantham), J. Dearden, M.Sc., F.I.M. (Derby), R. V. Riley, Ph.D., A.I.M. (Chesterfield), J. I. Williams, B.Sc., A.R.I.C., A.I.M. (Loughborough); *Hon. Secretary*: J. W. Gailer, M.Sc., F.R.I.C., A.I.M. (Department of Science, Nottingham and District Technical College, Shakespeare Street, Nottingham).

PRODUCTIVITY TEAM FROM THE NON-FERROUS METALS INDUSTRY

A Productivity Team, chiefly representing the copper industry, recently visited the United States to study the methods of production and the productivity of the non-ferrous metals industry there. The team was led by Mr. W. F. Brazener, managing director of The Mint, Birmingham, Ltd., and the other members were:

Supervisory Group: A. J. Bourne (Works Manager, Earle, Bourne and Co., Ltd., Birmingham); W. L. Govier (Factory Manager, I.C.I., Ltd., Metals Division, Birmingham); W. J. Bannister (Divisional Manager, British Insulated Callenders Cables, Ltd., Prescot); W. Walden (Works Manager, John Wilkes, Sons, and Mapplebeck, Ltd., Birmingham); J. F. Walker (Brass foundry foreman, Enfield Rolling Mills, Ltd., Enfield). *Technical Group*: V. B. Hysel (Research Metallurgist, Thomas Bolton and Sons, Ltd., Stoke-on-Trent); R. Lee (Development Engineer, The Yorkshire Copper Works, Ltd., Leeds); J. E. Newson (Assistant Manager in charge of Brass Section, Vickers-Armstrongs, Ltd., Newcastle-on-Tyne); J. A. Thompson (Chief Cost Accountant, I.C.I., Ltd., Metals Division, Birmingham); L. E. Dyer (Chief Mechanical Engineer, Enfield Rolling Mills, Ltd., Enfield). *Operative Group*: R. Baldwin (Head roller, Enfield Rolling Mills, Ltd., Enfield); A. Goodwin (Brass and bronze wire mill operative, Thos. Bolton and Sons, Ltd., Stoke-on-Trent); R. L. Richards (Extrusion press operator, Charles Clifford and Son, Ltd., Birmingham); J. W. Warwick (Branch Secretary, National Union of General and Municipal Workers, The Yorkshire Copper Works, Ltd., Leeds); J. W. Wilkinson (Chargehand millwright, strip mill, I.C.I., Ltd., Metals Division, Birmingham). *Team Secretary*: A. L. Molineux (Assistant Managing Director, Winfields Rolling Mills, Ltd., Birmingham).

INTERNATIONAL CONGRESS ON ANALYTICAL CHEMISTRY, 1952

Considerable progress has been made in connection with the arrangements for the International Congress on Analytical Chemistry which is to be held in Britain in 1952.

It has been decided that the meetings shall be held in Oxford, commencing on 4 September. Accommodation will normally be provided in Colleges, but some Hotel accommodation will also be available. The technical sessions will take place in one of the main University buildings.

The period of the Congress will include a week-end, and excursions and visits will be planned to take place during this period.

The arrangements for the Congress are in the hands of a General Committee representing a wide variety of interests and under the Chairmanship of the President of the Royal Society, Sir Robert Robinson, O.M.

The scope of the Congress is under active consideration by an Executive Committee, under the Chairmanship of the President of the Society of Public Analysts and Other Analytical Chemists, Mr. G. Taylor, M.B.E., F.R.I.C., and further details of this and other matters will be published in due course. The Honorary Secretary is Mr. R. C. Chirnside, F.R.I.C., Research Laboratories, The General Electric Co., Ltd., Wembley, Middlesex.

APPOINTMENTS VACANT

BRITISH CAST IRON RESEARCH ASSOCIATION. Vacancies for porosity investigation. Applications are invited from suitably qualified persons for employment on the research staff of the British Cast Iron Research Association. Three vacancies exist:

1. Research worker with good basic scientific training and with some knowledge of foundry practice, preferably a graduate.
2. Physicist, preferably with an honours degree in physics. Previous knowledge or experience of metallurgical research an advantage.
3. Metallurgist, preferably qualified in metallurgy or physics, research experience an advantage.

These three appointments will be required to investigate various aspects of the production of sound castings, involving considerations of metal flow into moulds, solidification rates, and mechanisms. The appointments will be in the Scientific Officer or Senior Scientific Officer grades. The Scientific Officer salaries range from £390 to £635 per annum, and Senior Scientific Officer salaries from £685 to £880 per annum. The actual salary and grade will depend on experience and qualifications.

Applicants should submit full details of qualifications, age, and experience to British Cast Iron Research Association, Alvechurch, Birmingham.

CHEMICAL OR METALLURGICAL ENGINEERS, preferably with experience of high temperature and vacuum processes, are invited to apply for a vacancy on our research staff. The initial duties of the successful applicant will include the design and testing of a pilot plant and the study of its operations. Salary according to qualifications and experience. Apply in confidence to Secretary, Magnesium Elektron, Ltd., Clifton Junction, nr. Manchester.

DROP FORGERS in Birmingham area require an assistant metallurgist with experience in the metallography of aluminium alloys. Applications, giving full particulars of experience and salary required, to Box No. 296, Institute of Metals, 4 Grosvenor Gardens, London, S.W.1.

INDUSTRIAL CHEMIST. A well qualified and experienced industrial chemist, chemical engineer, or extraction metallurgist is required for development work and to study the technology and economics of certain high temperature and vacuum metallurgical extraction processes. Salary according to qualifications and experience. Apply in confidence to Secretary, Magnesium Elektron, Ltd., Clifton Junction, nr. Manchester.

INORGANIC CHEMIST interested in research work and the development of processes from the laboratory stage to the large scale is required for a senior vacancy on our chemical research staff. Applicants should possess a 1st or 2nd Class Hons. degree in chemistry and have a few years of industrial experience. Salary according to qualifications and experience. Apply in confidence to Secretary, Magnesium Elektron, Ltd., Clifton Junction, nr. Manchester.

MAGNAL PRODUCTS LIMITED, Warmley, Bristol, invite applications for an assistant metallurgist experienced in the casting of aluminium alloys and magnesium alloys. Duties will consist of general metallurgical control of foundry and associated processes. Salary in accordance with training and experience. Applications should be made in writing to the Chief Metallurgist.

MAGNESIUM ELEKTRON, LTD., invites applications from qualified chemists with interest in research and development work for positions in its chemical research department. The subjects include high temperature and vacuum and metallurgical extraction processes, and the production of inorganic chemicals. Salaries in accordance with qualifications and experience. Applications giving full details which will be treated in confidence should be sent to the Secretary, Magnesium Elektron, Ltd., Clifton Junction, nr. Manchester.

MARCONI'S WIRELESS TELEGRAPH CO., LTD., require a metallurgical chemist for duties mainly concerned with chemical analysis. Applicants, who should be between 25 and 30 years of age and possess a recognized qualification in metallurgy or chemistry, should write giving full details of experience and quoting reference 427A to Central Personnel Services, English Electric Co., Ltd., 24-30 Gillingham Street, London, S.W.1.

METALLURGICAL SOCIETY requires indexer for its publications. Applicants should have a knowledge of metallurgy, chemistry, or physics (preferably a degree), and some experience of technical indexing is very desirable. Superannuation scheme in operation. Write, giving full details and salary required, to Box No. 297, Institute of Metals, 4 Grosvenor Gardens, London, S.W.1.

PHYSICAL CHEMIST. A qualified and experienced physical and/or inorganic chemist is required to lead a small research and development group which will study some high-temperature and vacuum processes. Salary according to qualifications and experience. Apply in confidence to Secretary, Magnesium Elektron, Ltd., Clifton Junction, nr. Manchester.

THE INSTITUTE OF METALS

President :

H. S. TASKER, Esq., B.A.

Secretary :

Lieut.-Colonel S. C. GUILLAN, T.D.

Editor :

N. B. VAUGHAN, M.Sc., F.I.M.

Assistant Secretary :

Major R. E. MOORE

Administrative and Editorial Offices:

4 GROSVENOR GARDENS, LONDON, S.W.1

Telephone :

SLOANE 5928 & 6233

INSTITUTE NEWS AND ANNOUNCEMENTS

ELECTION OF A FELLOW: MR. W. H. HENMAN

The Council has elected Mr. WILLIAM HENRY HENMAN, Chairman and Governing Director of John Wilkinson and Sons (Saltley), Ltd., Birmingham, to be a Fellow in recognition of his eminent services to the Institute. The number of Fellows is limited to twelve, and the Fellowship is the highest honour that can be bestowed for services to the Institute.

ELECTION OF COUNCIL FOR 1951-52

In accordance with the Articles of Association, the following are due to retire from the Council at the 1951 Annual General Meeting :

President :

H. S. TASKER, B.A.

Past-President :

SIR WILLIAM GRIFFITHS, D.Sc., F.R.I.C., F.Inst.P., F.I.M.

Vice-Presidents :

S. F. DOREY, C.B.E., D.Sc., Wh.Ex., M.I.Mech.E., F.R.S.
PROFESSOR A. J. MURPHY, M.Sc., F.I.M.

Ordinary Members of Council :

J. ARNOTT, F.R.I.C., F.I.M.
MAURICE COOK, D.Sc., Ph.D., F.I.M.
D. P. C. NEAVE, M.A., M.I.Mech.E.

Under Article 19, MR. TASKER will fill the vacancy on the Council as Past-President.

In accordance with Article 22, the Council nominates the following members to fill the other vacancies :

As President :

A. J. MURPHY, M.Sc., F.I.M., Professor of Industrial Metallurgy, Birmingham University; Member of Council of the British Non-Ferrous Metals Research Association.

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As Vice-Presidents :

A. B. GRAHAM, General Manager, Henry Wiggin and Co., Ltd., Glasgow ; Past-Chairman, Scottish Local Section.

P. V. HUNTER, C.B.E., M.I.E.E., Joint Deputy Chairman, British Insulated Callender's Cables, Ltd., London ; Chairman, Thomas Bolton and Sons, Ltd., Widnes ; Chairman, British Telecommunications Research, Ltd. ; Chairman, Telegraph Condenser Co., Ltd. ; Director, W. T. Glover and Co., Ltd. ; Director, Metropolitan Electric Cable and Construction Co., Ltd. ; Director, Craigpark Electric Cable Co., Ltd.

As Ordinary Members of Council :

K. W. CLARKE, A.I.M., Chief Metallurgist, The de Havilland Aircraft Co., Ltd., Edgware.

H. F. SHERBORNE, M.C., M.A., C.I.Mech.E., C.I.E.E., A.I.N.A., A.I.Mar.E., Director and Manager, The Yorkshire Copper Works, Ltd., Leeds ; Member of the Electricity Board, Yorkshire Area ; Member of Council, British Non-Ferrous Metals Research Association.

CHRISTOPHER SMITH, F.I.M., Chief Metallurgist, James Booth and Co., Ltd., Birmingham ; Member of the Research Board, British Non-Ferrous Metals Research Association.

Members are reminded that, in accordance with Article 22, any ten members may also at, or before, the Autumn General Meeting (18-21 September 1950), nominate in writing, with the written consent to act if elected of the person nominated, any duly qualified person other than one of those nominated by the Council to fill any vacancy on the Council, but each such nominator is debarred from nominating any other person for the same election. If two or more persons are nominated for any honorary office they (or such of them as are not Ordinary Members of Council who are not retiring at the next Annual General Meeting) will be deemed to have been nominated also for any vacancies among the Ordinary Members of Council. No person is eligible to fill any vacancy at such Annual General Meeting unless he has consented in writing to be nominated and has been nominated or deemed to be nominated for the same in compliance with this Article.

SENIOR VICE-PRESIDENT, 1951-52

The Council has elected Dr. C. J. SMITHELLS, M.C., F.I.M., to serve as Senior Vice-President for the year 1951-52.

COUNCIL: REPRESENTATIVE OF THE ADMIRALTY

Captain (E) L. A. B. PEILE, D.S.O., M.V.O., R.N., of the Engineer-in-Chief's Department, has been nominated by the Lords Commissioners of the Admiralty to be their representative at meetings of the Council, in succession to Captain (E) J. E. COOKE, R.N., who is shortly leaving for Malta.

The Council has expressed its thanks to Captain Cooke for the interest that he has shown in the Institute's work and for his services to the Institute during the time that he has been the Admiralty's representative.

NEWS AND ANNOUNCEMENTS

MAY LECTURE, 1951

The Right Hon. Sir JOHN ANDERSON, P.C., G.C.B., G.C.S.I., G.C.I.E., F.R.S., has accepted the Council's invitation to deliver the 1951 May Lecture. The subject and date of the lecture will be announced in due course.

EASTER VACATION TOUR FOR JUNIOR AND STUDENT MEMBERS IN 1951

An educational tour for Junior and Student members will be held in 1951 in South Wales, and will last for a week. Particulars will be announced in due course. It is hoped that the tour will be well attended and that this announcement may be helpful to those who might have been considering the arrangement of other tours. Lecturers will be permitted to attend the tour with their students.

JUNIOR MEMBERSHIP

The main purpose of the changes effected in the Articles of Association by the Special Resolution passed at the Extraordinary General Meeting of the Institute held on 27 June (as recorded in the *Journal* last month) was to create a new class of membership in the Institute.

Persons between the ages of 25 and 28 years will in future be admitted as Junior Members. This represents an intermediate stage between student membership (which will now cease at the age of 25) and full membership of the Institute. Subscription rates are given below.

RATES OF SUBSCRIPTION TO THE INSTITUTE

The rates of subscription to the Institute of Metals are given below, with, in parentheses, the reduced rates of subscription applicable to members of the Iron and Steel Institute or the Institution of Metallurgists. There is no entrance fee. Particulars of membership may be obtained from the Secretary, 4 Grosvenor Gardens, London, S.W.1.

Ordinary Members : £4 4s. (£3 13s. 6d.) p.a.

Junior Members : £2 15s. (£2 10s.) p.a.

Student Members : £1 15s. (£1 11s.) p.a.

ELECTION OF ORDINARY MEMBERS, JUNIOR MEMBER, AND STUDENT MEMBERS

The following 16 Ordinary Members, 1 Junior Member, and 5 Student Members were elected on 25 July 1950 :

As Ordinary Members

BORNEMANN, Alfred, Dr.Eng., M.E., Professor of Metallurgy, Stevens Institute of Technology, Hoboken, N.J., U.S.A.

BRAMLEY, George Edward Arthur, Ph.D., M.Sc., Chief Metallurgist, Aluminium Wire and Cable Company, Ltd., Port Tennant Works, Swansea.

COFFINBERRY, Arthur S., B.E., M.S., S.D., Group Leader for Physical Metallurgy, Los Alamos Scientific Laboratory, University of California, Los Alamos, N. Mex., U.S.A.

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- COLLET, Raoul, Sous-Directeur, Compagnie Française des Métaux, Sérifontaine (Oise), France.
- HANSER, Klaus, Dipl.Ing., Managing Director, Osnabrücker Kupfer- und Drahtwerk, Osnabrück, Germany.
- HOLST, Wilhelm, Dr.Tech., Managing Director, Studieselskapet for Norsk Industri, Munkedamsveien 53B, Oslo, Norway.
- JOHNSON, Geoffrey Alan, B.Sc., Vice-President, The Robert Mitchell Co., Ltd., 64 Decarie Boulevard, St. Laurent, Que., Canada.
- KAY, Sydney, Director and Chief Engineer, Cooper Roller Bearings Co., Ltd., King's Lynn, Norfolk.
- MARKIN, Alan, Officer in Charge, Routine and Research Laboratories, E.M.F. Electric Company (Pty.), Ltd., 991 Rathdown Street, North Carlton, Vic., Australia.
- NOURSE, John Dudley, Metallographer, Bristol Aeroplane Co., Ltd., Bristol.
- QUADT, R. A., M.S., Director of Research and Development, Aluminum Division, Hunter Douglas Corporation, Blaine and Pachappa Streets, Riverside, Calif., U.S.A.
- SLOCOMBE, Harry Eric, Plant Layout Engineer, C.A.V., Ltd., Acton, London, W.3.
- SLOOFF, Arnout, Dr.Ir., Chemical Consultant, Orionlaan 92, Hilversum, Holland.
- SWAROOP, M., Works Manager, The Hind Metal Works, Ltd., Khirni Gate, Aligarh, India.
- TIPTON, Clyde Raymond, M.S., Physical Metallurgist, Los Alamos Scientific Laboratory, University of California, Los Alamos, N. Mex., U.S.A.
- TRANIER, Jean Lucien Marcel, Chief Metallurgist, L'Industrielle Métallurgique, S.A.R.L., 13 Boulevard de Vintimille, Marseille, France.

As Junior Member

- RANDLE, Keith Charles, B.Sc., Physicist, Research Laboratories, The General Electric Co., Ltd., Wembley, Middlesex.

As Student Members

- ABDOU, A. H., B.Sc., Postgraduate Student, Sir John Cass Technical Institute, 3 Jewry Street, London, E.C.3.
- CHAPLIN, Norman John, B.A.Sc., Graduate Student, University of Toronto, Ont., Canada.
- DANKO, Joseph C., Student of Metallurgy, Carnegie Institute of Technology, Shenley Park, Pittsburgh 13, Pa., U.S.A.
- DAVIDSON, Roy Campbell, Student of Metallurgy, University of Melbourne, Carlton, Vic., Australia.
- SEATON, Raymond, Student of Metallurgy, Sheffield University, St. George's Square, Sheffield 1.

The following 11 Ordinary Members and 3 Student Members were elected on 18 August 1950 :

As Ordinary Members

- BROWN, Arthur James Stephen, B.Sc. (Eng.), Director in Charge of Production, J. Stone and Co., Ltd., Deptford, London, S.E.14.
- DUVAL, Robert, Ing., Engineer, Anciens Établissements Aubert et Duval, 41 rue de Villiers, Neuilly-sur-Seine, France.

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- EBORALL, Robert Kenneth, Works Chemist and Metallurgist, Metal Sales Company (Pty.), Ltd., Box 24, Benoni, Transvaal, South Africa.
- GUEST, Joseph Clifford, B.Sc., Research Metallurgist, T.I. (Group Services), Ltd., Plume Street, Birmingham 6.
- LEVER, Reginald Ernest, Managing Director, Richard Thomas and Baldwins (Argentina), S.A., Reconquista 314 Piso 1, Buenos Aires, Argentina (mail: 47 Park Street, London, W.1.)
- OWEN, Charles Penrhyn, Works Manager, Metal Sales Company (Pty.), Ltd., Box 24, Benoni, Transvaal, South Africa.
- PRESTON, Bryan Wentworth, M.A., Vice-Chairman, J. Stone and Co., Ltd., 1A Cockspur Street, London, S.W.1.
- SHEPPARD, Norman John, Metallurgist, Small Arms Factory, Department of Supply, Commonwealth of Australia, P.O. Box 70, Lithgow, N.S.W., Australia.
- SMITH, Robert, B.Met.E., Lecturer in Metallography, Metallurgy School, University of Melbourne, Carlton, Melbourne N.3, Vic., Australia.
- SOLOMON, John Graham, Metallurgist, Small Arms Factory, Department of Supply, Commonwealth of Australia, P.O. Box 70, Lithgow, N.S.W., Australia.
- WAGSTAFF, Raymond Claude, B.Sc., Metallurgist, J. Stone and Co., Ltd., Charlton, London, S.E.7.

As Student Members

- BONDS, John Douglas, Laboratory Assistant, Johnson and Sons (Assayers), Ltd., 74 Hatton Garden, London, E.C.1.
- HODGSON, Brian John Rubery, Laboratory Assistant, Bristol Aeroplane Co., Ltd., Bristol.
- WALKER, David Gaston, B.Sc., Student, Metallurgy Department, University of Melbourne, Carlton, Melbourne N.3, Vic., Australia.

PAPER BY PHRAGMÉN

In view of its outstanding interest and importance, a limited number of reprints of the paper "On the Phases Occurring in Alloys of Aluminium with Copper, Magnesium, Manganese, Iron, and Silicon", by the late GÖSTA PHRAGMÉN, which appears in this issue, are available, price 5s. post free (2s. 6d. post free to members). Applications, with a remittance, should be sent to the Secretary.

DISCUSSION OF PAPERS

In order to assist the Committee responsible for arranging the programmes of the General Meetings of the Institute, will all members who are prepared to discuss orally any of the papers published in the *Journal* please inform the Secretary as soon as possible.

It is hoped that such information will enable programmes to be arranged which will secure well-attended and lively discussions.

PERSONAL NOTES

MR. A. W. ARMSTRONG has been awarded the Associateship of the Birmingham Central Technical College.

DR. J. B. AUSTIN, Director of the Research Laboratories of the U.S. Steel Corporation, has been appointed a trustee of the American Society for Metals.

MR. G. L. BAILEY, Director of the British Non-Ferrous Metals Research Association, has been elected Vice-Chairman of the Committee of Directors of Research Associations.

MR. W. BARR, Chief Metallurgist of Colvilles, Ltd., has been appointed Chairman of the Divisional Panel of the Metallurgy Division of the British Iron and Steel Research Association. He succeeds Dr. C. Sykes.

MR. U. G. BHAT has left the Indian Smelting and Refining Co., Ltd., Bombay, to study in the Metallurgical Engineering Department at Lehigh University, Bethlehem, Pa., U.S.A.

MR. D. C. BROWN has left the Research Laboratories of the General Electric Co., Ltd., in order to take a post as metallurgist with Rotol, Ltd., Gloucester.

MR. G. N. CALE has recently joined the British Leather Manufacturers' Research Association, Milton Park, Egham, as Research Engineer.

MR. H. J. G. CHALLIS has left Swansea to take up the appointment of Division Chief Analyst in the Research Department of Imperial Chemical Industries, Ltd., Metals Division, Witton, Birmingham 6.

DR. W. F. CHUBB has been appointed Foundation Professor of Metallurgy at the King Fouad 1st University, Cairo. He will also act as consulting metallurgist to the Egyptian Government in connection with their long-term industrial development programme.

MR. D. L. W. COLLINS has graduated from the Royal School of Mines with the degrees of A.R.S.M. and B.Sc.(Eng.), both with 2nd class Honours. He is now a research metallurgist with Aluminium Laboratories, Ltd.

MR. R. A. CRESSWELL has left the Tin Research Institute and is now Research Metallurgist with The British Oxygen Co., Ltd., Morden Works, London, S.W.19.

MAJOR H. B. DESHPANDE, has been nominated by the Government of India as a member of the reconstituted Metals Research Committee for three years.

MR. E. F. EMLEY, metallurgist with Magnesium Elektron, Ltd., has been awarded the Ph.D. degree of London University.

MR. J. H. FARMER, J.P., Director and General Manager of Wm. Gray and Co., Ltd., West Hartlepool, has recently retired.

MR. GORDON H. FIELD has resigned his position as Director of Research, Aluminium Laboratories, Ltd., Banbury, after 20 years' service with the Aluminium, Ltd., group of companies. He will in future be available in a consulting or similar capacity.

NEWS AND ANNOUNCEMENTS

MR. K. S. GANAPATI has been transferred to the Metal and Steel Factory (Indian Ordnance Factories), Ishapore, W. Bengal.

LIEUT.-COLONEL SIR JOHN GREENLY has retired from the chairmanship of Babcock and Wilcox, Ltd., but retains a seat on the board of directors.

MR. I. L. GWYNNE has recently been appointed Works Manager of P.I. Castings (Altrincham), Ltd., Altrincham, Cheshire.

MR. W. H. HALL, Lecturer in Metallurgy at the University of Birmingham, has received the degree of Ph.D. for his work on X-ray diffraction by cold-worked metals.

MR. T. A. HENDERSON has graduated B.Sc. (Hons.) in Metallurgy at King's College, Newcastle-on-Tyne.

MR. W. H. HENMAN has been re-elected President of the British Non-Ferrous Metals Federation for the year 1950-51.

MR. H. A. HOARE has left de Havilland Aircraft Co., Ltd., and joined Aluminium Laboratories, Ltd., Banbury, as a research metallurgist.

MR. R. JAMES is now on the managerial staff of J. F. Ratcliff (Metals), Ltd., Birmingham.

DR. F. LÁSZLÓ has now returned to the Engineering School, Melbourne University, after a stay in this country.

MR. H. MARGOLIN has recently been awarded the degree of Doctor of Engineering of Yale University.

MR. G. H. MITCHELL has been awarded the degree of B.Sc. (2nd class Hons.) in Applied Chemistry (Metallurgy) by Glasgow University.

MR. W. R. E. NICE is now engaged as Research Metallurgist with H. J. Enthoven and Sons, Ltd., Croydon.

MR. E. G. NISBETT has graduated B.Sc. (Hons.) in Applied Chemistry (Metallurgy) at Glasgow University.

DR. E. OROWAN has been appointed Professor of Mechanical Engineering at the Massachusetts Institute of Technology, Cambridge, Mass., U.S.A., and will take up his duties there at the beginning of October. He expects to sail on 21 September.

MR. M. S. PATERSON, of Melbourne, has been granted a Fellowship at the Institute for the Study of Metals, Chicago, for the year 1950-51.

MR. A. PRINCE has been transferred from the General Chemical Division of Imperial Chemical Industries, Ltd., at Widnes to the Fertilizer and Synthetic Products Division at Billingham.

MR. S. J. RAMAGE has recently left for India and his address will be c/o Indian Copper Corporation, P.O. Ghatsila, Dist. Singhbhum, Chota Nagpur, India.

MR. K. RAY has been transferred to the Office of the High Commissioner for India in London and is likely to be in this country for some time.

MR. W. J. S. ROBERTS has been appointed Chief Metallurgist at the new cold-reduction plant and tinplate works of the Steel Company of Wales, Ltd., at Trostre.

NEWS AND ANNOUNCEMENTS

MR. W. S. ROBINSON has been awarded the Bronze Medal of the Australasian Institute of Mining and Metallurgy.

MR. K. SACHS has been awarded the degree of M.Sc. (External) of London University.

MR. P. M. B. SLATE has been awarded the degree of B.Met. (Hons.) in non-ferrous metallurgy at Sheffield University.

MR. NEVILLE S. SPENCE has been transferred to the Head Office of Dominion Magnesium, Ltd., at Toronto, Ont., on his appointment as Director of Technical Service and Development.

DR. G. H. STANLEY, Honorary Corresponding Member to the Council for South Africa, has been on a visit to this country since April and will be returning shortly to Johannesburg.

MR. C. R. TOTTLE has resigned his post as Lecturer in Metallurgy in the University of Durham in order to take charge of the metallurgical laboratories of the Springfields Factory of the Ministry of Supply, Department of Atomic Energy.

DR. KENT R. VAN HORN has been appointed Associate Director of Research of the Aluminum Company of America, New Kensington, Pa. Since 1945 he had been an Assistant Director of Research in charge of the Company's branch laboratory at Cleveland, O.

MR. L. E. WARD has been awarded the Studentship of the Associated Lead Manufacturers, Ltd., for postgraduate research at the Imperial College of Science and Technology.

MR. J. WARING has been awarded the degree of B.Sc.Tech., with first-class honours in metallurgy, at the University of Manchester, and has now taken up a position as metallurgist with C. H. Johnson and Son, Ltd., Manchester.

MR. R. D. WEBER is now a metallurgist with Enfield Rolling Mills, Ltd., Brimsdown, Middlesex.

MR. J. T. WOODHOUSE, who was recently awarded the B.Sc. degree of Leeds University, has been appointed Assistant Metallurgist with the Park Gate Iron and Steel Co., Ltd.

Note : Will members (in addition to informing the Institute's administrative department of changes of address, occupation, &c.) kindly notify the Editor, *separately*, of all changes of occupation, appointments, award of honours and degrees, &c., as these matters interest their fellow-members.

DEATHS

The Editor regrets to announce the deaths of :

MR. MARTIN ALEXANDER, B.Sc., Metallurgist, Ministry of Supply, Department of Atomic Energy, Risley, Lancs.

MR. JOHN CURRAN, C.B.E., Chairman, Edward Curran Engineering, Ltd., Cardiff.

MR. GEORGE EDWARD HEYL, Dipl.-Ing., Consultant, Mill Hill, London, N.W.7.

MR. ALEXANDER PARK NEWALL, Chairman and Managing Director, A. P. Newall and Co., Ltd., Glasgow.

NEWS OF LOCAL SECTIONS AND ASSOCIATED SOCIETIES

LIVERPOOL METALLURGICAL SOCIETY ASSOCIATED WITH THE INSTITUTE

The Council has approved an application by the Liverpool Metallurgical Society to become an "Associated Society" and has agreed financial terms under which all members of the Institute who are resident in the Liverpool area and who desire to do so may receive (free of cost) notices from, and attend the meetings of, the Society.

Members who wish to take advantage of this arrangement should notify the Secretary without delay. The programme of meetings of the Society for the 1950-51 session will be included in the full programme of meetings of Local Sections and Allied Societies, which will be sent to all members resident in the United Kingdom.

OTHER NEWS

THE INSTITUTION OF METALLURGISTS: NEW ELECTIONS

The following elections have recently been announced :

As Fellows from the Grade of Associate

H. E. Arblaster (Commonwealth Aircraft Corpn. (Pty.), Ltd.), H. E. Bennett (Johnson, Matthey and Co., Ltd.), S. W. Hollingum (Ministry of Supply, Aeronautical Inspection Department), G. K. Ogale (College of Engineering, Poona).

As Associates

J. C. Collins (English Steel Corpn., Ltd.), W. K. Congreve (Research Student, Manchester University), P. S. Cotton (The Mond Nickel Co., Ltd.), R. N. H. Gardner (C. H. Parsons, Ltd.), L. M. Hatchett (English Steel Corpn., Ltd.), M. Krishna (Indian Standard Metal Co., Ltd.), E. H. Lloyd (Industrial Newspapers, Ltd.), P. J. F. Miller (E.M.I. Factories, Ltd.), A. Ottewell (Leyland Motors, Ltd.), F. H. Poole (Eva Bros., Ltd.), J. H. M. A. Reid (Imperial Chemical Industries, Ltd., Metals Division), K. W. Smith (Humber, Ltd.), J. E. Srawley (The Mond Nickel Co., Ltd.), J. C. Tucker (Aluminium Laboratories, Ltd.), J. L. Wolfenden (Thomas Bolton and Sons, Ltd.).

As Associate from the Grade of Licentiate

R. G. Cook (R. B. Tennent, Ltd.).

As Licentiates

E. W. Bennett (Imperial Smelting Corpn., Ltd.), (Miss) M. E. M. Fiedler, R. W. Firth (David Brown Foundries Co.), F. C. Foreman (British Railways), W. H. Grain (Frederick A. Power and Sons (Saltley), Ltd.), J. B. Logan (National Foundry College, Wolverhampton), H. H. Vevers (Design and Research Centre for the Gold, Silver, and Jewellery Industries).

NEWS AND ANNOUNCEMENTS

SYMPOSIUM ON HIGH-TEMPERATURE STEELS AND ALLOYS FOR GAS TURBINES

The Iron and Steel Institute is organizing a Symposium on High-Temperature Steels and Alloys for Gas Turbines which will be held at the Institution of Civil Engineers, London, on Wednesday and Thursday, 18 and 19 October 1950.

In association with this Symposium, the fifth Hatfield Memorial Lecture will be delivered by Air Commodore Sir Frank Whittle, in the Lecture Theatre of the Institution of Electrical Engineers, on Tuesday, 17 October, at 8.30 p.m.

Members of the Institute of Metals are cordially invited to attend the Lecture and the Symposium and to take part in the discussions at the latter.

A circular giving a provisional list of papers to be presented at the Symposium is available from the Secretary of the Iron and Steel Institute, 4 Grosvenor Gardens, London, S.W.1.

A registration fee of 10s. will be payable by those participating in the Symposium. A buffet lunch has been arranged on each day, and there will be a dinner at the Hyde Park Hotel on the evening of Wednesday, 18 October.

CONFERENCE ON SCIENTIFIC METHOD IN INDUSTRIAL PRODUCTION

The Industrial Applications Section of the Royal Statistical Society is organizing a conference at Sheffield University on "Scientific Method in Industrial Production", at which technicians and managements of manufacturing concerns will be able to meet statisticians interested in industrial problems.

The conference lasts from 2.30 p.m. on Friday, 29 September, to the afternoon of Sunday, 1 October. The sessions on Friday, in particular, have been designed for non-statistical audiences. Applications for attendance at the Conference, for which a fee of 1 guinea will be charged, should be sent to the Assistant Secretary, The Royal Statistical Society, 4 Portugal Street, London, W.C.2.

JOURNEES INTERNATIONALES DE L'ANALYSE ET DES ESSAIS

This conference will be held at the Maison de la Chimie, Paris, from 20 to 24 November 1950. It is being organized by the Société de Chimie Industrielle in conjunction with the Groupement Technique de l'Analyse et des Essais. The proceedings will be divided into five sections: (1) Laboratory Apparatus, (2) Physicochemical Techniques, (3) Inorganic Chemical Analysis, (4) Organic Chemical Analysis, and (5) Biochemical Analysis and Hygiene. In connection with the conference, an exhibition of laboratory equipment and industrial control apparatus will be held on 18-24 November. Full details can be obtained from the Société de Chimie Industrielle, 28 rue Saint-Dominique, Paris (7^e).

SPECIAL COURSES AT NORTHAMPTON POLYTECHNIC

The following two courses of lectures will be given during the next Session in the Applied Physics Department of the Northampton Polytechnic, St. John Street, London, E.C.1.

NEWS AND ANNOUNCEMENTS

Industrial Spectroscopy.—The course will consist of an introductory group of lectures and practical work on the basic principles of spectroscopy, followed by a series of groups of lectures on recent developments in various branches of applied spectroscopy. Wednesdays, 7–9 p.m., commencing 11 October 1950. Lecturer, C. A. Padgham, A.R.C.S., M.Sc., D.I.C.

X-Ray Diffraction.—The course will provide an introduction to the fundamental principles and experimental techniques of X-ray diffraction, with particular reference to chemical and metallurgical applications. Thursdays, 7–9.30 p.m., commencing 12 October 1950. Lecturer, A. E. de Barr, B.Sc., F.Inst.P.

THE CHEMICAL SOCIETY RESEARCH FUND

The Research Fund of the Chemical Society provides grants for the assistance of research in all branches of Chemistry. About £700 per annum is available for this purpose, the income being derived from a donation of the Worshipful Company of Goldsmiths, from the Perkin Memorial Fund, and from other sources.

Applications for grants will be considered in November next and should be submitted on the appropriate form not later than Wednesday, 1 November 1950. Applications from Fellows will receive prior consideration.

Forms of application together with the regulations governing the award of grants may be obtained from the General Secretary, The Chemical Society, Burlington House, Piccadilly, London, W.1.

DIARY FOR SEPTEMBER–OCTOBER

THE INSTITUTE

MONDAY, 18 SEPTEMBER TO FRIDAY, 22 SEPTEMBER

Autumn Meeting in Bournemouth. (For Programme, see June, 1950, issue of the *Journal*.)

LOCAL SECTIONS MEETINGS

THURSDAY, 28 SEPTEMBER

Birmingham Local Section.—Lecture by Dr. C. H. Desch. (James Watt Memorial Institute, Great Charles Street, Birmingham, at 6.30 p.m.)

THURSDAY, 5 OCTOBER

London Local Section.—E. A. G. Liddiard: Chairman's Address, "Organization of Research". (Institute of Metals, 4 Grosvenor Gardens, London, S.W.1, at 7 p.m.)

TUESDAY, 10 OCTOBER

South Wales Local Section.—E. A. Hontoir: Chairman's Address, "The Revival of the Non-Ferrous Metal Industry in South Wales". (Metallurgical Department, University College, Singleton Park, Swansea, at 6.30 p.m.)

NEWS AND ANNOUNCEMENTS

OTHER MEETINGS

FRIDAY, 15 SEPTEMBER

Institution of Production Engineers, North Eastern Graduate Section.—F. A. Broad: "Pressure Die-Casting". (Neville Hall Mining Institution, Westgate Road, Newcastle-on-Tyne 1, at 7 p.m.)

MONDAY, 18 SEPTEMBER

Institution of Production Engineers, Derby Sub-Section.—J. B. Wilson: "Magnesium-Zirconium Alloys". (School of Art, Green Lane, Derby, at 7 p.m.)

THURSDAY, 5 OCTOBER

Leeds Metallurgical Society.—J. Mackenzie: "Refractories". (Chemistry Department, The University, Leeds 2, at 7 p.m.)

Liverpool Metallurgical Society.—Dr. Marie Gayler: "Age-Hardening". (Lecture Theatre, Electricity Service Centre, Whitechapel, Liverpool, at 7 p.m.)

WEDNESDAY, 11 OCTOBER

Institution of Heating and Ventilating Engineers.—Dr. J. S. Blair: "Design and Manufacture of Steel Tubes". (Institution of Mechanical Engineers, Storey's Gate, London, S.W.1, at 6 p.m.)

THURSDAY, 12 OCTOBER

Birmingham Metallurgical Society.—Presidential Address. (James Watt Memorial Institute, Great Charles Street, Birmingham, at 6.30 p.m.)

APPOINTMENTS VACANT

CHEMICAL OR METALLURGICAL ENGINEERS, preferably with experience of high temperature and vacuum processes, are invited to apply for a vacancy on our research staff. The initial duties of the successful applicant will include the design and testing of a pilot plant and the study of its operations. Salary according to qualifications and experience. Apply in confidence to Secretary, Magnesium Elektron, Ltd., Clifton Junction, nr. Manchester.

INDUSTRIAL CHEMIST. A well qualified and experienced industrial chemist, chemical engineer, or extraction metallurgist is required for development work and to study the technology and economics of certain high temperature and vacuum metallurgical extraction processes. Salary according to qualifications and experience. Apply in confidence to Secretary, Magnesium Elektron, Ltd., Clifton Junction, nr. Manchester.

INORGANIC CHEMIST interested in research work and the development of processes from the laboratory stage to the large scale is required for a senior vacancy on our chemical research staff. Applicants should possess a 1st or 2nd Class Hons. degree in chemistry and have a few years of industrial experience. Salary according to qualifications and experience. Apply in confidence to Secretary, Magnesium Elektron, Ltd., Clifton Junction, nr. Manchester.

MAGNESIUM ELEKTRON, LTD., invites applications from qualified chemists with interest in research and development work for positions in its chemical research department. The subjects include high temperature and vacuum and metallurgical extraction processes, and the production of inorganic chemicals. Salaries in accordance with qualifications and experience. Applications giving full details which will be treated in confidence should be sent to the Secretary, Magnesium Elektron, Ltd., Clifton Junction, nr. Manchester.

METALLURGICAL SOCIETY requires male editorial assistant. It is intended that this post shall lead to a position of responsibility. Requirements: a degree in metallurgy, physics, or chemistry; knowledge of French and German. Experience not essential. Superannuation scheme. Applications with details of qualifications and salary required to Box 299, Institute of Metals, 4 Grosvenor Gardens, London, S.W.1.

NEWS AND ANNOUNCEMENTS

PHYSICAL CHEMIST. A qualified and experienced physical and/or inorganic chemist is required to lead a small research and development group which will study some high temperature and vacuum processes. Salary according to qualifications and experience. Apply in confidence to Secretary, Magnesium Elektron, Ltd., Clifton Junction, nr. Manchester.

THE A.P.V. COMPANY require an **ASSISTANT METALLURGIST** for development work in connection with the welding of non-ferrous metals. Age under 30. Applicants should have degree or equivalent qualification; some experience in the welding field would be desirable but is not essential. Apply in writing to Laboratory Manager, The A.P.V. Company, Ltd., Wandsworth Park, London, S.W.18.

UNIVERSITY OF BIRMINGHAM, Department of Industrial Metallurgy. Applications are invited for the post of **LECTURER in INDUSTRIAL METALLURGY (Grade II)** at a salary within the range £550-£1100. Applicants must possess a degree in metallurgy, engineering, or related science. The duties will include lecturing in one of the following fields: working of metals, principles of foundry technology, production engineering applied to metallurgical industry. The lecturer will be encouraged to undertake research, for which facilities will be available. Further particulars may be obtained from the undersigned, to whom applications should be sent within fourteen days of the appearance of this notice.

C. G. BURTON, Secretary, The University, Birmingham 3.

APPOINTMENT REQUIRED

APPLIED PHYSICIST with special experience in metallurgy, German, age 41, Dr.-Ing. (honours), seeks a responsible post in industry in this country. Has Government permission to take employment here. Since 1946 has undertaken special work at the request of the Ministry of Supply (17 months). 12 years' experience in production, management, development, and industrial research. Specialist in pressing, deep drawing, lubrication, surface treatment, and finishing. First-class references as to ability and character. Box No. 298, The Institute of Metals, 4 Grosvenor Gardens, London, S.W.1.

NORTHAMPTON POLYTECHNIC

St. John Street, London, E.C.1.

Department of Applied Chemistry : Session 1950-51.

Part-Time Day and Evening Classes will be conducted in the following subjects :

Metallurgy (Including Engineering Metallurgy).
Electrodeposition and Metal Finishing.
Fuel Technology.
General Chemical Technology.
Chemical Engineering.
Glass Technology and Glass Working.
Scientific German.

In addition, the following special evening lecture courses have been arranged :

"Refractories, Their Manufacture, Properties, and Uses".
Commencing Tuesday, 3 October, at 7 p.m.

"Some Aspects of Metal Finishing". Commencing Tuesday,
12 December, at 7 p.m.

Enrolments : 13-15 September, inclusive (New Students 15 September only).

Full particulars available on application to the Northampton Polytechnic.

THE STRUCTURE OF METALS AND ALLOYS

By WILLIAM HUME-ROTHERY, M.A., D.Sc., F.R.S.

Seventh (revised) Reprint

Cloth. Pp. 137 with 61 Figures

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THE INSTITUTE OF METALS

4 Grosvenor Gardens, London, S.W.1.